CONFERENCE PAPERS, COMMENTS, and NOTES

The following is a list of working papers, notes, and outlines from the conference, "The Changing Banking Structure and Its Impact On Small Business," held in Washington, D.C. on June 15, 2000. The materials are listed in alphabetical order by the last name of the principal author. The views expressed are those of the authors and not of the U.S. Small Business Administration or of the authors' respective agencies.

Avery, Robert, Federal Reserve Board, and Katherine Samolyk, Federal Deposit Insurance Corporation (FDIC). "Bank Consolidation and the Provision of Banking Services: The Case of Small Commercial Loans" (outline/notes).

Berger, Allen, Federal Reserve Board. An Overview (outline/notes)

Cavaluzzo, Ken, and Linda Cavaluzzo, Georgetown University and Center for Naval Analyses. "Competition, Small Business Financing, and Discrimination" (outline/notes). The article was published in Business Access to Capital and Credit: A Federal Reserve System Research Conference, proceedings of a conference held in Arlington, Virginia, March 8-9, 1999.

Collender, Robert, U.S. Department of Agriculture (comments).

Dunkelberg, William and Jonathan Scott, Temple University. "Bank Consolidation, Small Business, and Capital Markets" (working paper).

Eisenbeis, Robert, Federal Reserve Bank of Atlanta. "Credit Scoring and Lending to Small Business" (outline/notes).

Emmons, William, Federal Reserve Bank of St Louis. "Unobserved Risk and the Choice of Borrowing Method: Evidence from Small Business Uses of Credit Cards" (working paper).

Hall, Thomas, Capital Studies, Milken Institute, "Are There Needed Policy Actions?" (summary notes).

Hancock, Diana, Federal Reserve Board. "The Credit Crunch and the Availability of Credit to Small Business" (outline/notes). The paper is published in the Journal of Banking and Finance. See http:www.elsevier.nl/cas/tree/store/jbf/sub/1998/22/6-8/1318.pdf

Lang, William, Office of the Comptroller of the Currency, " Notes for Hancock's paper on the Credit Crunch and the Availability of Credit to Small Business". (Notes)

Leach, James A., Chairman, Committee on Banking and Financial Services, U. S. House of Representatives (see written remarks at www.house.gov/banking/61500pr2.htm).

Nolle, Daniel, Office of the Comptroller of the Currency. "Internet Banking: Development and Prospects" (working paper).

White, Lawrence, New York University. "How Do De Novo Banks Impact Small Business Lending?" (outline/notes).

Bank Consolidation and the Provision of Banking Services: The Case of Small Commercial Loans

By
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Presentation for the SBA Conference on
The Changing Banking Structure and Its Impact
On Small Business
June 15, 2000

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Bank Consolidation and Small Business Lending

- There is concern that as banks become larger and more complex, they will shift their focus and resources away from smaller customers that are more costly to serve.

- Concern seems justified given that small business lending is funded disproportionately by small banks (See table 1).

- But, credit availability depends on the behavior of other suppliers in the local market (small business lending is a fairly easy product area to get into as a de novo bank or other local lender).

- Still, small business borrowers may find it harder to obtain credit from new suppliers (given the inherent costs and risks that cause the market to be localized in the first place).

Evidence about the impact of bank consolidation

- Difficult to study credit availability at the market level because Call Report data on small loans to businesses and farms do not include geographic detail about where loans are made.

- Most studies focus on the behavior of individual banks because the data are reported at the bank-level.

- Generally, compare the "quantity" of small business lending by banks involved in merger activity to that of banks not involved in merger activity (controlling for other things.)

- Results depend on the time period studied, the sample of banks used, and how bank merger activity is measured.

  But, generally the evidence suggests that bank mergers of large banks into even larger ones are associated with declines in small business lending—at least as a proportion of total bank assets.

What about overall small business credit availability?

- Berger, Saunders, Scalise, and Udell estimate the overall effect of merger and acquisition activity on small business lending during a 15-year period.

- Estimate that, in the aggregate, merger-related changes are more than offset by increases in lending by other banks and thrifts.

What about credit availability at the local market level?

- Small business credit markets considered to be fairly local for the purposes of bank antitrust analysis. So it is important to ask how consolidations affect small business lending in local markets.

- We approximate the local market definitions used in antitrust analysis (metropolitan statistical areas and rural counties). Use geographic deposit data to estimate the geographic distributions of small business loans reported by banks and thrifts since 1993.

- Small business lending in a given market is then just the sum of the lending by each bank and thrift in the market.

- Study whether small business loan growth in local markets is related to local merger activity during two study periods: 1993-1995 and 1995-1997.

Measuring bank consolidation

- Key to any study of bank consolidation is how consolidation is measured.

- We measure bank consolidation as the *share* of the local small business loan market (measured in dollars) that was acquired by another banking organization (holding company or independent bank) during a given study period.

- Expansive definition: includes holding company acquisitions and mergers of unaffiliated banks (excludes consolidations of holding company affiliates).

Measuring merger-related changes in local lending

- Our market-level approach allows us to measure lending in a market by merging banks, de novo institutions, and other local lenders.
- On average, merging banks contract lending while other lenders offset the effect of this contraction in the local market (See table 2).
- *But what about particular types of markets or particular types of merger activity?*

Characteristics of local merger activity

- ***Level of merger activity:*** Below or above the median level of merger activity

  Median market had 11% of its SB loans acquired.
  Low merger activity: less than 11% of the local SB loan market is acquired.
  High merger activity: more than 11% of the local SB loan market is acquired.

- ***Size of merging banks:*** The shares of local merger activity where

  Big banks acquire big banks (assets>=$1billion 1993 dollars)
  Big banks acquire small banks (assets<$1billion 1993 dollars)
  Small banks acquire small banks (assets<$1billion 1993 dollars)

- ***Market overlap of merging firms***: The shares of local merger activity where

  Acquirer has local presence as SB lender prior to the acquisition (in-market merger)
  Acquirer has no local presence as SB lending prior to the acquisition (out-of-market merger).

Characteristics of local market

- Separate analysis of Urban and Rural markets
- Separate analysis of high concentration versus low concentration markets (Herfendahl Index of less than or more than 1800).

Classifying markets in terms of their dominant type of merger activity

Table 3: Different types of markets experience different types of merger activity.

Table 4: Different types of markets experience different small business loan growth rates.

Measuring relationships between lending and merger activity

- Multivariate regressions linking local small business loan growth (Table 4) to the nature of local merger activity (Table 3)--controlling for differences in local banking and economic conditions (see Table 5).

- Table 6: The overall level of merger activity is not systematically related to loan growth in urban samples, but there is evidence of negative relationship to loan growth in rural samples

- Table 7: Specific types of merger activity appear to be related to small business lending

  In the MSA sample, we find merger-related effects in concentrated markets; evidence of lower average loan growth associated with within-market mergers (consistent with anti-competitive effects); some evidence of higher loan growth associated with out-of-market acquisitions of small banks.

  In rural markets, some evidence that acquisitions by large banks are associated with lower loan growth; mixed evidence about mergers among small banks.

The Bottom line:

- The relationship between bank mergers and small business lending is complex. Evidence of merger-related effects primarily in smaller or more concentrated markets. But not all effects are negative; some acquisitions of smaller banks are associated with higher local loan growth.

- These results differ from home mortgage lending studies that indicate negligible effects.

- ***Our results are consistent with the notion that small business loan markets remain more local in nature than other bank product markets. And as such, scrutiny of proposed mergers from a small business lending perspective remains justified.***

Related research: Studying credit availability at the market level

- Since 1996, some banks have been reporting small business loan originations under the auspices of CRA

  Only larger institutions are required to report the CRA data and CRA data are "flow" data on calendar-year originations, rather than "stocks" of outstanding loans dollars.

- We use these data to compare geographic deposit taking patterns to geographic small business lending activities.

  Banks report originating CRA loans in markets where they do not have deposit-taking branches, but generally small amounts of originations in unbranched markets.

  Evidence suggests deposit-taking patterns are reasonable estimates of lending patterns.

  But do not have loan origination data for small banks.

Concluding remarks

Important Issue: Small business lending is likely to remain one of the few banking products that is relatively local in nature.

Evidence is difficult to produce

- Bank consolation is a complex phenomenon that affects bank customers in the particular markets for the banking services that they seek.

- Limitations to the available data

  Call Report data used in bank small business studies do not measure lending to a well-defined group of small businesses, but measure outstanding small loans to businesses.

  Nonbank financial intermediaries, such as finance companies, do not report data on their small business loans, and are not included in most studies.

  Sparse evidence exists regarding other terms of credit (besides quantity) so we can't say much about how credit terms (interest rates, collateral requirements, and maturity) are affected by bank consolidation. Bank regulators do not systematically collect these types of data for most banks.

Table 1: Distribution of Bank Assets and Deposits

By bank asset size class[1]

Asset size:	*All*	<$300M	$300M-$1B	$1B-$10B	>$10B
Organizations (number)					
1993	10,962	10,149	530	224	59
1997	9,057	8,185	587	226	59
Assets (percent)					
1993	100.0	20.1	7.6	18.3	54.0
1997	100.0	18.1	7.1	15.3	59.5
Deposits (percent)					
1993	100.0	34.6	7.2	16.4	41.8
1997	100.0	27.2	7.6	15.2	49.9
Small business loans (percent)					
1993	100.0	35.1	11.4	19.9	33.5
1997	100.0	30.7	12.5	18.4	38.4
Large business loans (percent)					
1993	100.0	7.2	3.8	15.2	73.8
1997	100.0	5.3	3.8	13.9	77.0
Other Loans (percent)					
1993	100.0	16.2	7.8	19.7	56.3
1997	100.0	12.7	7.2	15.8	64.3

1 Assets size classes are measured in 1993 dollars.

Table 2: Decomposition of Market-level Small Business Loans Growth Rates

Averages by type of market and type of lender

	1993-1995	1995-1997
Large MSAs		
Total net change	4.81	10.32
Net change consolidators[1]	-0.52	-0.84
Net change all others (offset)[2]	5.33	11.16
In market in beginning of period	4.38	10.17
New entrants	0.96	0.99
Small MSAs		
Total net change	9.19	10.43
Net change consolidators[1]	-0.14	-0.36
Net change all others (Offset)[2]	9.33	10.79
In market in beginning of period	8.36	9.26
New entrants	0.97	1.53
Rural counties		
Total net change	12.18	12.65
Net change consolidators[1]	0 .15	-0.43
Net change all others (offset)[2]	12.03	13.08
In market in beginning of period	10.51	11.09
New entrants	1.52	1.99

[1]Total net change in small business loan lending for organizations involved in consolidations in the intervening two year period times 100 divided by the same denominator as used to compute total net growth rates.

[2] Total net change in small business loan lending for all organizations not involved in consolidations times 100 divided by the same denominator as used to compute total net growth rates. This is decomposed into the change due to organizations that operated in the first period and the change in lending by all others.

Table 3: Consolidation Activity in Sample markets

	All markets		High Herfendahl Markets		Low Herfendahl Markets	
	93-95	***95-97***	***93-95***	***95-97***	***93-95***	***95-95***
Percent of MSA sample experiencing						
No consolidation	***11.9***	***22.7.3***	***23.3***	***35.6***	***5.7***	***16.0***
Low level of consolidation activity	***44.8***	***46.4***	***37.9***	***38.6***	***48.4***	***50.5***
Where the main type of consolidation activity is						
In-market big bank acquires big bank	4.4	9.5	1.9	4.0	5.7	12.4
In-market big bank acquires small bank	11.5	10.9	10.7	6.9	12.0	12.9
In-market small bank acquires small bank	4.8	6.1	0.0	4.0	7.3	7.2
Out-of-mkt. big bank acquires big bank	13.9	6.8	12.6	6.9	14.6	6.7
Out-of-mkt. big bank acquires small bank	5.1	5.8	5.8	6.9	4.7	5.2
Out-of-mkt. small bank acquires small bank	5.1	7.5	6.8	9.9	4.2	6.2
High level of consolidation activity	***43.4***	***30.9***	***38.8***	***25.7***	***45.8***	***33.5***
Where the main type of consolidation activity is						
In-market big bank acquires big bank	5.8	10.9	1.0	5.9	8.3	13.4
In-market big bank acquires small bank	7.1	3.1	1.9	2.0	9.9	3.6
In-market small bank acquires small bank	1.7	1.4	0.0	0.0	2.6	2.1
Out-of-mkt. big bank acquires big bank	21.4	10.5	25.2	10.9	19.3	10.3
Out-of-mkt. big bank acquires small bank	7.1	4.4	9.7	5.9	5.7	3.6
Out-of-mkt. small bank acquires small bank	0.3	0.7	1.0	1.0	0.0	0.5
Number of markets	*295*	*295*	*103*	*101*	*192*	*194*
Percent of nonMSA sample experiencing						
No consolidation	***46.2***	***59.0***	***48.4***	***61.2***	***38.9***	***52.0***
Low level of consolidation activity	***25.7***	***18.1***	***24.0***	***16.9***	***31.6***	***22.2***
Where the main type of consolidation activity is						
In-market big bank acquires big bank	1.4	0.7	1.2	0.4	2.1	1.5
In-market big bank acquires small bank	3.6	2.8	3.4	2.8	4.2	3.0
In-market small bank acquires small bank	2.4	1.3	2.2	1.0	3.1	2.0
Out-of-mkt. big bank acquires big bank	8.2	5.8	7.2	5.6	11.4	6.6
Out-of-mkt. big bank acquires small bank	4.9	3.9	5.7	4.0	2.1	3.5
Out-of-mkt. small bank acquires small bank	5.3	3.6	4.3	2.9	8.1	5.6
High level of consolidation activity	***28.1***	***22.9***	***27.7***	***22.0***	***29.5***	***25.8***
Where the main type of consolidation activity is						
In-market big bank acquires big bank	0.8	1.5	0.5	1.4	2.1	2.0
In-market big bank acquires small bank	1.8	1.7	1.8	1.0	1.6	3.5
In-market small bank acquires small bank	1.3	0.8	1.0	0.6	2.6	1.5
Out-of-mkt. big bank acquires big bank	12.9	9.2	12.8	9.1	13.5	9.6
Out-of-mkt. big bank acquires small bank	7.0	5.7	7.4	5.7	5.7	5.6
Out-of-mkt. small bank acquires small bank	4.3	3.9	4.3	4.0	4.2	3.5
Number of non MSA markets	*844*	*844*	*651*	*646*	*193*	*198*

Notes: High (low) level of consolidation if more (less) than 11 percent of the small business loan lending was made by organizations that were acquired in the 18 months following the beginning of the study period. In-market refers to an acquisition by an another organization that is already operating in the market as of the beginning-of-period June 30th reporting date. Big acquires big refers to consolidations where both the acquired and acquired organizations had greater than $1 billion in assets. Big acquires small indicates that the acquirer had more than $1 billion in assets but the acquired bank had less. Small acquires small implies both parties had less than $1 billion in assets.

Table 4: Mean Small Business Loans Growth (percent)

	All markets		High Herfendahl Markets		Low Herfendahl Markets	
	1993	1995	1993	1995	1993	1995
MSA sample						
No consolidation	***7.6***	***12.7***	***6.3***	***11.8***	***10.3***	***13.7***
Low level of consolidation activity	***9.6***	***11.2***	***9.6***	***9.2***	***9.6***	***12.0***
Where the main type of consolidation activity is						
In-market big bank acquires big bank	-3.3	4.8	-20.7	-19.8	-0.2	8.9
In-market big bank acquires small bank	13.2	14.8	12.3	19.8	13.7	13.4
In-market small bank acquires small bank	5.6	9.6	--	8.8	5.6	9.9
Out-of-mkt. big bank acquires big bank	12.1	11.4	11.1	7.6	12.6	13.4
Out-of-mkt. big bank acquires small bank	9.1	14.9	8.8	17.3	9.2	13.3
Out-of-mkt. small bank acquires small bank	9.9	12.1	12.0	8.9	8.0	14.7
High level of consolidation activity	***6.5***	***7.6***	***8.3***	***6.3***	***5.7***	***8.1***
Where the main type of consolidation activity is						
In-market big bank acquires big bank	1.6	4.6	-1.0	-6.0	1.8	7.0
In-market big bank acquires small bank	7.7	10.2	-14.6	8.9	10.1	10.6
In-market small bank acquires small bank	1.6	14.2	--	--	1.6	14.2
Out-of-mkt. big bank acquires big bank	6.7	6.8	6.4	3.9	6.9	8.3
Out-of-mkt. big bank acquires small bank	11.5	8.5	22.4	12.3	1.6	5.2
Out-of-mkt. small bank acquires small bank	-28.0	37.7	-28.0	64.9	--	10.6
Number of markets	*295*	*295*	*103*	*101*	*192*	*194*
NonMSA sample						
No consolidation	***14.5***	***13.5***	***13.7***	***13.5***	***17.7***	***13.2***
Low level of consolidation activity	***8.7***	***10.8***	***6.5***	***9.5***	***14.3***	***13.9***
Classified by main type of consolidation activity						
In-market big bank acquires big bank	11.8	6.8	10.8	12.3	13.7	1.2
In-market big bank acquires small bank	5.9	8.5	4.0	7.2	11.0	12.5
In-market small bank acquires small bank	11.9	11.8	8.3	9.3	20.3	16.0
Out-of-mkt. big bank acquires big bank	6.8	8.3	2.4	7.7	16.1	9.9
Out-of-mkt. big bank acquires small bank	6.6	13.8	5.7	12.7	14.6	17.5
Out-of-mkt. small bank acquires small bank	13.1	13.9	14.1	10.4	11.3	19.8
High level of consolidation activity	***11.6***	***12.0***	***11.1***	***12.1***	***13.1***	***11.7***
Classified by main type of consolidation activity						
In-market big bank acquires big bank	14.1	6.3	14.5	9.0	13.8	0.2
In-market big bank acquires small bank	7.8	11.1	6.7	10.0	12.1	12.3
In-market small bank acquires small bank	26.7	19.5	40.1	11.6	10.7	30.1
Out-of-mkt. big bank acquires big bank	11.5	10.1	10.4	9.9	14.8	10.7
Out-of-mkt. big bank acquires small bank	7.0	11.0	6.3	10.9	9.9	11.3
Out-of-mkt. small bank acquires small bank	16.0	18.7	16.9	20.1	13.1	13.2
Number of markets	*295*	*295*	*103*	*101*	*192*	*194*

Notes: High (low) level of consolidation if more (less) than 11 percent of the small business loan lending was made by organizations that were acquired in the 18 months following the beginning of the study period. In-market refers to an acquisition by an another organization that is already operating in the market as of the beginning-of-period June 30th reporting date. Big acquires big refers to consolidations where both the acquired and acquired organizations had greater than $1 billion in assets. Big acquires small indicates that the acquirer had more than $1 billion in assets but the acquired bank had less. Small acquires small implies both parties had less than $1 billion in assets.

Table 5: Variable Definitions

Baseline merger variables

Low Merger Activity:	Dummy variable that equals one if the market had a low level of consolidation activity
High Merger Activity:	Dummy variable that equals one if the market had a high level of consolidation activity

Merger variables: Classifying markets in terms of the overall level of consolidation activity and by the main type of consolidation activity

Low MA-In/BigBig:	A low level of consolidation activity, mainly in-market big bank acquires big bank(s).
Low MA-In/BigSm:	A low level of consolidation activity, mainly in-market big bank acquires small bank(s).
Low MA-In/SmSm:	A low level of consolidation activity, mainly in-market small bank acquires small banks(s).
Low-MA-Out/BigBig:	A low level of consolidation activity, mainly out-market big bank acquires big bank(s).
Low MA-Out/BigSm:	A low level of consolidation activity, mainly out-market big bank acquires small bank(s).
Low-MA-Out/SmSm:	A low level of consolidation activity, mainly out-market small bank acquires small bank (s).
High MA-In/BigBig:	A high level of consolidation activity, mainly in-market big bank acquires big bank(s).
High MA-In/BigSm:	A high level of consolidation activity, mainly in-market big bank acquires small bank(s).
High MA-In/SmSm:	A high level of consolidation activity, mainly in-market small bank acquires small banks(s).
High MA-out/BigBig:	A high level of consolidation activity, mainly out-market big bank acquires big bank(s).
High MA-out/BigSm:	A high level of consolidation activity, mainly out-market big bank acquires small bank(s).
High MA-out/SmSm:	A high level of consolidation activity, mainly out-market small bank acquires small bank(s).

Banking market control variables

Offices Per-capita:	Offices Per 10,000 Persons, beginning of period (BOP)
Deposit Herfendahl:	Herfendahl Index of deposit market (out of 10,000) beginning of period
Big Bank Share:	Share of the small business loans held by large organizations (assets>$1billion), BOP.
Number of Banks:	Number of banking organizations having branches in the Market, beginning of period
Thrift Deposit Share:	Share of the deposit market held by thrifts, beginning of period.
Deposits Per-capita:	Deposits per capita ($1000's), beginning of period.
Deposit Growth Lagged	Deposit growth in the two years prior to the current period.
Deposit Growth Current:	Deposit growth in the current two-year period.

Other market control variables

Population lagged:	Population (1000s) beginning of prior two-year period
Population Growth Lagged:	Population growth in the two years prior to the current period.
Population Growth Current:	Population growth in the current two-year period.
Per-capita Income lagged:	Income per capita ($1000s) beginning of prior two-year period
PC Income Growth Lagged:	Per-capita Income growth in the two years prior to the current period.
PC Income Growth Current:	Per-capita Income growth in the current two year period.
Unemployment Rate lagged:	Unemployment rate (%) beginning of prior two-year period
UE Rate Change Lagged:	Change in the UE rate in the two years prior to the current period.
UE Rate Change Current:	Change in the UE rate in the current two-year period.
House Prices Change Lagged:	Change in index measuring median housing prices in the two-years prior to the current period.
House Prices Change Current:	Change in index measuring median housing prices in the current two-year period.
Personal Bankruptcy Rate:	Personal bankruptcies per capita, beginning of period.
Bankruptcy rate Chg. Current:	Change in the Personal Bankruptcies per-capita in the current period(*).

Table 6: Small Business Loan Growth and the Level of Merger Activity

Coefficients on Consolidation Variables

	All Markets		High Herfendalh Markets		Low Herfendalh Markets	
	93-95	***95-97***	***93-95***	***95-97***	***93-95***	***95-97***
MSA markets						
Intercept	32.660*** (11.067)	6.694 (7.668)	50.742* (30.046)	0.707 (21.204)	18.503 (11.746)	14. 631* (8.386)
Low Merger Activity	3.437 (2.911)	0.020 (1.633)	2.227 (5.832)	0.864 (3.649)	4.385 (3.617)	-0.119 (1.821)
High Merger Activity	-0.361 (2.894)	-0.794 (1.889)	0.547 (5.475)	1.077 (4.074)	1.654 (3.666)	-1.337 (2.129)
Memo Items:						
Number of Observations	294	294	102	100	191	193
Mean Dependent Variable	8.00	10.40	8.34	9.36	7.82	10.94
R Squared	.181	.459	.202	.468	.385	.537
NonMSA markets						
Intercept	23.270*** (7.804)	1.650 (6.517)	27.213*** (9.260)	-5.140 (7.850)	16.365 (18.988)	27.074* (14.391)
Low Merger Activity	-4.639*** (1.469)	-1.481 (1.346)	-4.512** (1.814)	-3.273** (1.683)	-5.469** (2.589)	2.693 (1.991)
High Merger Activity	-2.366* (1.455)	0.305 (1.234)	-1.522 (1.722)	0.733 (1.520)	-6.541** (2.675)	-0.036 (1.909)
Memo Items:						
Number of Observations	843	843	650	645	192	197
Mean Dependent Variable	12.18	12.65	11.27	12.54	15.24	13.00
R Squared	.207	.188	.208	.198	.264	.339

Standard errors are in parenthesis.
*, **, *** : Significant at the 10%, 5%, and 1 % level, respectively

Table 7: Small Business Loan Growth and Merger Activity

Coefficients on Consolidation Variables

Classification by the level and the main type of Consolidation Activity

	All Markets		High Herfendalh		Low Herfendalh	
	93-95	95-97	93-95	95-97	93-95	95-97
MSA Sample						
Low MA-In/BigBig:	-5.480	-2.699	-28.428*	-13.815*	-2.429	-0.868
	(4.947)	(2.470)	(14.817)	(8.249)	(4.874)	(2.563)
Low MA-In/BigSm:	5.366	0.864	-3.300	3.179	6.487	0.600
	(3.566)	(2.300)	(7.281)	(5.603)	(4.063)	(2.432)
Low MA-In/SmSm:	-0.801	0.224	NA	-4.670	1.355	0.965
	(4.943)	(2.720)		(7.142)	(4.754)	(2.816)
Low-MA-Out/BigBig:	5.333	-0.602	-0.331	-2.586	6.142	1.156
	(3.483)	(2.619)	(7.566)	(5.467)	(3.989)	(2.879)
Low MA-Out/BigSm:	3.041	2.796	6.789	7.485	1.019	-0.761
	(4.524)	(2.795)	(8.779)	(5.648)	(4.901)	(3.202)
Low-MA-Out/SmSm:	3.021	-0.838	1.457	-0.011	6.207	0.260
	(4.505)	(2.487)	(8.403)	(4.703)	(5.173)	(2.907)
High MA-In/BigBig:	-1.283	-1.864	4.139	-14.200**	2.221	0.908
	(4.474)	(2.705)	(19.064)	(7.050)	(4.478)	(3.067)
High MA-In/BigSm:	0.979	-4.581	-27.453**	-6.358	5.786	-3.998
	(4.078)	(3.636)	(13.529)	(9.420)	(4.266)	(3.623)
High MA-In/SmSm:	-3.664	0.590	NA	NA	-4.393	-2.589
	(7.150)	(5.736)			(6.323)	(5.201)
High MA-out/BigBig:	-1.037	-0.353	-6.456	-1.916	0.192	0.711
	(3.189)	(2.391)	(6.198)	(4.725)	(3.860)	(2.706)
High MA-out/BigSm:	3.233	-3.829	16.485**	6.601	-4.303	-5.838
	(4.011)	(3.212)	(6.915)	(6.713)	(4.849)	(3.657)
High MA-out/SmSm:	-31.931**	22.185***	-29.607*	48.454***	NA	-0.829
	(14.238)	(7.197)	(18.021)	(12.936)		(8.815)
Number of Observations	*294*	*294*	*102*	*100*	*191*	*193*
Mean Dependent Variable	*8.00*	*10.40*	*8.34*	*9.36*	*7.82*	*10.94*
R Squared	***.223***	***.491***	***.395***	***.621***	***.436***	***.551***

Standard errors are in parenthesis.

*, **, *** : Significant at the 10%, 5%, and 1 % level, respectively

Table 7: Small Business Loan Growth and Merger Activity (continued)

Coefficients on Consolidation Variables

Classification by the level and the main type of Consolidation Activity

	All Markets		High Herfendalh		Low Herfendalh	
	93-95	**95-97**	**93-95**	**95-97**	**93-95**	**95-97**
NonMSA Sample						
Low MA-In/BigBig:	-2.838 (4.900)	-4.091 (5.830)	-2.266 (6.240)	-0.275 (8.748)	-5.249 (7.525)	-3.249 (6.502)
Low MA-In/BigSm:	-4.893 (3.246)	-5.402* (3.013)	-5.268 (3.940)	-7.111** (3.685)	-2.072 (5.847)	2.085 (4.741)
Low MA-In/SmSm:	-5.634 (3.893)	0.382 (4.300)	-5.329 (4.819)	-1.323 (5.712)	-6.891 (6.497)	2.766 (5.485)
Low-MA-Out/BigBig:	-5.328** (2.262)	-2.485 (2.176)	-6.986** (2.853)	-3.443 (2.694)	-3.334 (3.724)	-0.293 (3.253)
Low MA-Out/BigSm:	-4.283 (2.783)	0.219 (2.550)	-4.295 (3.089)	-0.995 (3.052)	-2.316 (7.876)	3.538 (4.311)
Low-MA-Out/SmSm:	-3.564 (2.656)	0.541 (2.673)	-0.425 (3.472)	-4.024 (3.550)	-10.297*** (4.052)	7.087** (3.386)
High MA-In/BigBig:	0.440 (6.469)	-2.520 (4.089)	6.369 (10.021)	0.032 (5.194)	-11.858 (8.224)	-5.504 (5.874)
High MA-In/BigSm:	-5.500 (4.411)	-2.316 (3.910)	-5.832 (5.125)	-4.867 (5.809)	-6.671 (8.891)	-0.749 (4.446)
High MA-In/SmSm:	12.665** (5.132)	5.962 (5.365)	26.182*** (7.151)	0.280 (7.525)	-4.243 (7.152)	15.203** (6.165)
High MA-out/BigBig:	-1.107 (1.958)	-0.714 (1.796)	-0.863 (2.323)	-0.632 (2.199)	-4.640 (3.618)	-0.489 (2.768)
High MA-out/BigSm:	-7.549 (2.357)***	-1.772 (2.150)	-7.497*** (2.725)	-1.445 (2.609)	-8.657* (4.840)	-1.313 (3.502)
High MA-out/SmSm:	-0.736 (2.913)	6.033** (2.542)	1.222 (3.438)	8.142*** (3.045)	-8.341 (5.615)	-1.697 (4.211)
Number of Observations	*843*	*843*	*650*	*645*	*192*	*197*
Mean Dependent Variable	*12.18*	*12.65*	*11.27*	*12.54*	*15.24*	*13.00*
R Squared	*.224*	*.200*	*.239*	*.212*	*.281*	*.381*

Standard errors are in parenthesis.

*, **, *** : Significant at the 10%, 5%, and 1 % level, respectively.

AN OVERVIEW OF

THE CHANGING BANKING STRUCTURE AND ITS IMPACT ON SMALL BUSINESS

Allen N. Berger
Board of Governors of the Federal Reserve System
Wharton Financial Institutions Center

Presentation at the
SBA Conference on
The Changing Banking Structure and Its Impact on Small Business
Room 2220 Rayburn House Office Building
(House Banking Committee Hearing Room)
June 15, 2000 8:00 am

"MISSION IMPOSSIBLE"

- The theme of this conference — The Changing Banking Structure and Its Impact on Small Business — is a timely one both in terms of the current stream on research and importance for policy makers.

  - The conference speakers mostly cover the topic of the effects of bank mergers on small business lending, in some cases lending to certain types of small businesses (owned by minorities, women, the poor, etc.).

  - Conference speakers are also covering the effects of new technologies (credit scoring, the Internet, etc.), new market entry, and the effect of changing structure on the effect of monetary policy on small business lending.

- My assignment — should I decide to accept it — amounts to "Mission Impossible 3."

  - Give an overview of the entire theme of the conference — which includes all the topics covered by everyone else — plus some other relevant topics on the theme of the connection between bank structure and small business lending.

  - Do it all in 10 to 15 minutes!

"MISSION POSSIBLE"

- To turn this into "Mission Possible," I will limit myself to primarily discussing the research literature on two topics.

- 1) The topic of relationship-based finance, which is crucial to understanding the issue of the changing bank structure and its impact on small business.

  - Most studies of changes in bank structure on small business at least implicitly assume that it is a particular type of small business borrower whose credit availability may be threatened.

  - These are firms that are relatively informationally opaque and do not have strong financial statements.

  - Their credit availability and terms may depend on knowledge gained by their bank over time through the banking relationship.

  - In contrast, small businesses with strong balance sheets, good collateral, good public records, etc. are generally not thought to be the ones that are threatened by these changes in bank structure.

"MISSION POSSIBLE 2"

- 2) The effect of bank consolidation on the quantity of small business lending, the topic of this session.

- In my discussions of both topics, I will review the extant research literature to provide a background for most of the other speakers to build on in reporting their new research.
  - I will cover the results of about 100 research studies, which are listed at the back of the handout.
    - 15 minutes / 100 studies = 9 seconds / study

RELATIONSHIP-BASED FINANCE

- Relationship-based finance is one of the major tools used to provide funding to informationally opaque firms who otherwise would not qualify for sufficient external finance.
  - Relationship-based borrowers have a special relationship with their banks in which information is gathered over time and used to help the bank supply services to the borrower.

DEFINITION OF RELATIONSHIP-BASED FINANCE

- Relationship-based finance occurs when:
  - 1) Information is gathered by the provider of finance beyond the relatively transparent data available in the financial statements, observation of any collateral, and other public information.
  - 2) The information is gathered through contact over time between the provider and the firm, its owner, the firm's customers, local community, etc. (Not just through lending).
  - 3) The information remains confidential to the provider, who uses the information to help make additional decisions over time about future injections of capital, the evolution of contract terms, or monitoring strategies.

- At the opposite extreme is transactions-based finance, in which funds are provided on the basis of easily available information around the time that the funds are provided (Berger 1999).

RELATIONSHIP-BASED FINANCE (cont.)

- Relationship-based finance applies to some, but not all bank loans.
  - Bank lines of credit often represent continuous, exclusive relationships which provide information over time to the bank, sometimes in conjunction with checking accounts and the handling of accounts receivable.
  - In contrast, other bank loans (e.g., mortgages, motor vehicle loans) typically have little relationship content.
  - As a result, to the extent that changes in bank structure alter the treatment of small businesses, we expect it to affect their lines of credit, but not some other types of loans and other banking services.

- Relationship-based finance is not limited to banks and is not limited to debt contracts.
  - For example, a venture capitalist provides equity financing and maintains an important relationship with the firm. The VC gathers information through frequent visits to the firm and uses this information in subsequent financing decisions.

SOME FACTS ABOUT BANKING RELATIONSHIPS

- Banks are the largest single supplier of external finance to small businesses in the U.S. (18.75% of total finance), although only 40.57% of small businesses have any bank loans (1993 NSSBF, Berger and Udell 1998).

- Almost all firms have bank checking accounts, and 86.75% identify a bank their primary financial institution.

- Small businesses tend to have long relationships with their banks (7.77 years on average).

THE BENEFITS AND COSTS OF RELATIONSHIPS BETWEEN BANKS AND SMALL BUSINESSES

- The benefits of relationships include potentially getting more credit at better terms (lower rates, lower collateral requirements), since the bank gains valuable information over the course of the relationship that other lenders do not have.

  - Ironically, market power by the bank may play a positive role for the small business by allowing the bank to subsidize the borrower in the short term, and make more profits in later periods (e.g., Sharpe 1990).

    - As the market power of the bank increases, small businesses with lower credit quality may be able to obtain funding (Petersen and Rajan 1995).

    - Some studies found that less competition in banking is helpful to small firms and start-ups (Petersen and Rajan 1995, Bonaccorsi di Patti and Dell'Ariccia 2000), but other research suggests more bank competition is helpful (Black and Strahan 2000).

BENEFITS AND COSTS OF RELATIONSHIPS (2)

- Excessive exploitation of market power and the "locking in" to a single bank can also create other problems.
  - Businesses may establish costly multiple banking relationships to avoid exploitation or to avoid a negative inference if their bank drops them or if their bank fails.
  - High rates and/or the locking in of the bank may cause businesses to take on excessive risks, reduce managerial effort, or just not borrow.

THE EMPIRICAL RESEARCH ON RELATIONSHIPS BETWEEN BANKS AND SMALL BUSINESSES

- The research generally supports the notions that banks use relationships to garner information and that small businesses benefit from these relationships.

  - The research generally found that small businesses with stronger banking relationships had

    - lower loan rates,
    - fewer collateral requirements,
    - less dependence on trade credit,
    - greater credit availability, and
    - more protection against the interest rate cycle.

  - Not all results held in all studies and some of the European data was not always favorable (Hoshi, Kashyap, and Sharfstein 1990, Petersen and Rajan 1994,1995, Berger and Udell 1995, Blackwell and Winters 1997, Angelini, Di Salvo, and Ferri 1998, Berlin and Mester 1998, Cole 1998, Elsas and Krahnen 1998, Harhoff and Körting 1998a, Hubbard, Kuttner, Palia 1999, Ongena and Smith 1999, Scott and Dunkelberg 1999, Degryse and van Cayseele 2000, Longhofer and Santos 2000, Machauer and Weber 2000).

THE EMPIRICAL RESEARCH ON RELATIONSHIPS (2)

- The data also suggest that the breadth of the relationship is important.
  - Banks gather valuable private information and build information through providing checking accounts, savings accounts, and financial management services and use this information in credit decisions (Allen, Saunders, and Udell 1991, Nakamura 1993, Cole 1998, Mester, Nakamura, and Renault 1998).

THE EMPIRICAL RESEARCH ON RELATIONSHIPS (3)

- The data also suggests that relationships are valuable for firms that are sufficiently transparent as to have publicly traded stocks.

- Announcements of loan commitments yield abnormal positive stock returns on average for the borrowing firms, suggest that the relationships embodied by these commitments add value, and that the creation of this value is signaled to market participants. (e.g., Mikkelson and Partch 1986, James 1987, Lummer and McConnell 1989, Billett, Flannery, and Garfinkel 1995, Klapper 1998).

- Some research shows that publicly-traded firms also lose market value and are more likely to switch banks when their bank is a target in an M&A (Karceski, Ongena, and Smith 2000), or when their bank fails or is in financial distress (Slovin, Sushka, Polonochek 1993, Djankov, Jindra, and Klapper 1999).

    - These results are consistent with the hypothesis that relationships have value that may be reduced by bank M&As or failures.

- If relationships are valuable for publicly traded firms, they are likely even more valuable for small, relatively opaque firms.

THE EMPIRICAL RESEARCH ON RELATIONSHIPS (4)

- Some studies found that some small businesses have multiple relationships or switch banks, but the reasons are still unclear.
  - One study found that firms choose multiple relationships to avoid being labeled as uncreditworthy if their bank is in financial distress and withdraws credit (Detragiache, Garella, and Guiso 2000).
  - Other studies found that small, opaque firms less often have multiple banking relationships, perhaps because their relationships are so valuable (Harhoff and Körting 1998b, Berger, Klapper, Miller, and Udell 2000, Ongena and Smith 2000, Machauer and Weber 2000).
  - Studies found that large businesses have multiple banking relationships to avoid being "held up" by one bank (e.g., Houston and James 1996).
  - One study found that small firms that were opaque and growing tend to switch banks, perhaps to avoid these problems (Ongena and Smith 1999).
  - One study found that small, opaque firms less often borrow from foreign-owned banks, which may have more trouble forming local relationships (Berger, Klapper, Miller, and Udell 2000).

WRAP-UP ON RELATIONSHIP-BASED FINANCE

- Important topic.
- More research is needed!

BANK CONSOLIDATION AND SMALL BUSINESS LENDING

- The research and policy interest in the issue of bank consolidation and small business lending has been motivated by two facts.
  - The consolidation of the banking industry, which has been occurring at a rapid pace, largely due to deregulation.
  - Large banks devote a much smaller percentage of their assets to small business loans than small banks.
- Simply extrapolating into the future from these two facts would yield the conclusion that small business lending by the banking industry might be drastically cut (presumably relationship lending).
  - This simplistic analysis neglects the fundamental nature of M&As as **dynamic events** that may involve significant changes in business focus, which could mean either more or less small business lending.
  - The simplistic analysis also neglects the "external effect," that other lenders in the same local markets might pick up any profitable loans that are no longer supplied by the consolidated banking institutions.

EMPIRICAL RESEARCH ON THE EFFECTS OF BANK SIZE ON SMALL BUSINESS LENDING

- A number of studies have shown that large banking organizations devote lesser proportions of their assets to small business loans than do small organizations (e.g., Berger, Kashyap, and Scalise 1995, Keeton 1995, Levonian and Soller 1995, Berger and Udell 1996, Peek and Rosengren 1996, Strahan and Weston 1996).

  - Small banks — 9% of assets in small business lending, Large banks — 2% of assets in small business lending.

  - By simplistic analysis, looks like if $1 of assets were transferred from a small bank to a large bank, 7¢ of small business loans would be lost.

- In contrast, the effects of organizational complexity — operating in multiple states, being in more financial lines of business, etc. — are ambiguous (e.g., Keeton 1995, Whalen 1995, Berger and Udell 1996, Berger, Saunders, Scalise, and Udell 1998).

RESEARCH ON THE EFFECTS OF BANK SIZE (2)

- There is also evidence that directly links bank size and the market shares of large and small banks to different types of loans and loan contracts.
  - Larger banks and high market shares for large banks are associated with low interest rates and low collateral for small businesses that receive loans, suggesting that these banks avoid risky relationship-based lending (Berger and Udell 1996, Berger, Rosen, and Udell 2000).
  - Smaller businesses get their lines of credit (relationship-based finance) more often from small banks, and larger businesses tend to get their L/Cs from larger banks (Berger, Rosen, and Udell 2000).
  - Relative to small banks, large banks are also found to more often lend to larger, older, more financially secure businesses (Haynes, Ou, and Berney 1999).
  - Large banks were found to base their small business loan decisions more on financial ratios, whereas relationships mattered more to decisions by small banks (Cole, Goldberg, and White 1999).
- This evidence is consistent with the predicted focus on transactions-driven lending for large banks, and relationship-driven lending for small banks.

RESEARCH ON THE EFFECTS OF BANK SIZE (3)

- However, other evidence suggests that bank size and market shares of large banks do not matter much.
  - One study examined the probability that small business loan applications will be denied by consolidating banks and other banks in their local markets and found no clear positive or negative effects (Cole and Walraven 1998).
  - One study found that the probability that a small firm obtains a line of credit or pays late on its trade credit does not depend in an important way on the presence of small banks in the market (Jayaratne and Wolken 1999).

UNDERLYING THEORY BEHIND THE DISTRIBUTION OF SMALL BUSINESS LENDING

- Small institutions are generally limited to small business loans and cannot make large business loans because of legal lending limits and problems of diversification.

- Large institutions may be disinclined to extend relationship-driven small business loans because of Williamson (1967,1988) type organizational diseconomies associated with producing such loans along with transaction-driven loans and other services for larger customers.

  - The technology for dealing with small, informationally opaque relationship borrowers may be very different from that for providing credit to large, informationally transparent borrowers.

  - It may be costly (i.e., a diseconomy of scope) to provide the two different products with two different technologies in the same organization.

  - Again, it is not all small business lending that might be too expensive for large banks, just the lending to informational opaque, relationship-dependent firms.

EMPIRICAL RESEARCH ON THE EFFECTS OF BANK MERGERS AND ACQUISITIONS (M&As)

- A number of studies directly examined the effects of bank M&As on small business lending (e.g., Keeton 1996,1997, Peek and Rosengren 1996,1998, Strahan and Weston 1996,1998, Craig and Santos 1997, Kolari and Zardkoohi 1997a,b, Walraven 1997, Zardkoohi and Kolari 1997, Berger, Saunders, Scalise, and Udell 1998, Sapienza 1998).
  - The studies usually found that M&As involving large banking organizations reduced small business lending substantially.
    - However, M&As between small organizations were often found to increase small business lending.
  - These studies in effect included the dynamic effects of M&As in terms of a potential change in the focus of the consolidating institutions.

THE EXTERNAL EFFECT OF BANK M&As

- The other important dynamic effect of M&As is the "external effect" — the effect of M&As on the lending of other banks in the same local markets.

  - One study found that increases in the supplies of small business credit by these other banks tended to offset much, if not all of the negative effects of M&A participants (Berger, Saunders, Scalise, and Udell 1998).

  - Part of the external effect may be from de novo entry, i.e., new banks that form in markets where M&As occur (Goldberg and White 1998, DeYoung 1998, DeYoung, Goldberg, and White 1999, Seelig and Critchfield 1999, Berger, Bonime, Goldberg, White 2000).

    - I will shut up on the entry topic, since Larry White will tell us about it later today.

WRAP-UP ON THE EFFECTS OF BANK (M&As)

- Note that even if the external effect offset all of the reductions in small business lending by the consolidating banks, many of the borrowers may still suffer costs in terms of temporary disruptions in credit availability, higher rates, or more collateral requirements until their new banking relationships mature.

- More research on this topic is needed, and we will hear some today, including from Dunkelberg and Scott, and Avery and Samolyk in this session.

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Competition, Small Business Financing, and Discrimination: Evidence From a New Survey

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March 12, 2000

An earlier version of this paper was presented at the 2000 meetings of the American Economic Association. Ken Cavalluzzo thanks the Capital Markets Research Center for financial support. We thank Nicole Meleney for excellent research assistance. We also thank seminar participants at the McDonough School of Business, Georgetown University, and The Board of Governors of the Federal Reserve for useful comments. The authors are grateful to the Federal Reserve for the use of the data. The views expressed herein are those of the authors. They do not necessarily reflect the opinions of the Federal Reserve.

COMPETITION, SMALL BUSINESS FINANCING, AND DISCRIMINATION: EVIDENCE FROM A NEW SURVEY

ABSTRACT

A large body of literature investigates discrimination in home mortgage markets. In contrast, little is known about variation in access to credit across demographic groups for small businesses. This paper examines some of the factors that influence differences in small business credit market experiences across demographic groups. We analyze credit applications, loan denials, and interest rates paid across gender, race and ethnicity of small business owners. In addition, we analyze data gathered from small business owners who said they did not apply for credit because they believed that their application would have been turned down. This set of analyses, in combination with important new information on the personal credit history of the principal owner, the business credit history of the firm, a rich set of additional explanatory variables, and information on the competitiveness of local banking markets, helps us to understand better the sources of observed differentials in the credit market experiences of small business operators across demographic groups. The analyses reveal substantial unexplained differences in denial rates between African American and white-male owned firms. Moreover, consistent with Becker's classic theories (1957), we find evidence that the level of lender market competition in the firm's local banking market mitigates these differences.

JEL(J71, D40)

I. Introduction

Small businesses represent an important engine of growth in the U.S. economy. In order to facilitate that growth, those businesses often turn to institutional sources for credit. It is a concern, therefore, that a growing body of evidence suggests that owners of small businesses from some demographic groups may have less access to institutional financing than whites (Bates, 1973; Bates, 1991; Cavalluzzo and Cavalluzzo, 1998). The purpose of this paper is to shed light on some of the factors that influence observed differences in the credit market experiences of small businesses across demographic groups. We analyze credit applications, loan denials, and interest rates paid. In addition, we examine data gathered from small business owners who said they did not apply for credit because they believed that their application would have been turned down. In each analysis, we take advantage of newly available cross-sectional data on small businesses and the extent of competition in small business credit markets, to gain a better understanding of the sources behind the differences in credit market experiences across demographic groups.

It is well known that demographic differentials in credit market experiences may arise if the financial characteristics of the firm or its owners, or other risk factors, are correlated with demographic group. However, even after controlling for these factors, differentials across demographic groups may remain. If economically important factors that are used by lenders in the loan granting or rate setting process are correlated with demographic group, but are left uncontrolled by the researcher, then the estimated demographic coefficients will be biased by these omitted variables. Alternatively, lenders may be unable to observe, or it may be costly to collect, economically relevant information that is correlated with demographic group. If these lenders use demographic attributes as a proxy for missing information, then the resulting disparate treatment has an economic basis. This form of disparate treatment is called statistical discrimination (Phelps, 1972). Some differentials could also arise from differences in preferences for credit use, or the propensity to apply for credit, on the part of the borrower. Differentials may

also arise because of taste-based preferences of the lender – commonly referred to as non-economic or "prejudicial" discrimination (Becker, 1957).

We use data from the 1993 National Survey of Small Business Finances (NSSBF) to examine the degree to which information on firm and owner characteristics explains observed differences in credit market experiences of small businesses. We supplement NSSBF data with information furnished by the Board of Governors of the Federal Reserve on local bank market structure and Dun and Bradstreet firm credit (risk) scores. The NSSBF data set is the most extensive public data set available on small businesses. An important feature of the NSSBF data set is that it includes firms that do not use credit markets. These data allow us to test for possible selection biases (Heckman, 1979), and to investigate the level and variation in "discouraged borrower" effects by demographic group. By discouraged borrowers, we mean small business owners who would have applied for credit, but did not, because they thought that their application would be rejected.

We begin with an analysis of observed interest rates, for those businesses that obtained a loan within the last three years of the survey interview date. Next, we analyze credit denials, conditional on having applied for a loan within the last three years. These first two analyses are appropriate to the task of explaining observed differences in interest and denial rates because observed rates are conditional on these same factors. An examination of credit needs among small business owners and an analysis of the propensity of those owners to avoid applying for a loan because they believed that their application would have been rejected follow these analyses.[1] In the next section of the paper, we incorporate these "discouraged borrowers" into our sample of applicants to estimate the gap in unmet credit needs between small business owners who are white males and others. In contrast to the previous model, which estimates denials for the subpopulation that applied for credit, this second model provides estimates for the larger subpopulation of businesses who needed credit. In the final analytic section of the paper, we

[1] In our work, credit needs are demonstrated by owners who either applied for a loan or did not apply for fear of being turned down.

introduce a joint model of the decision to apply and then be denied a loan (Van de Ven and Van Pragg, 1981; Bloom, Preiss, and Trussell, 1983). This selection model is one variant of econometric approaches developed to provide an estimate of the gap in access to credit that one would expect to observe taking into account the full set of data and the data generating process of the accept/reject decision.

In each of our analyses, we investigate the importance of the financial characteristics of the firm, the characteristics of the principal owner (e.g. owner education, and years of work experience), information on self-reported firm and owner credit history, a credit score constructed by Dun and Bradstreet, and information regarding a firm's relationships with financial institutions and suppliers. We also interact demographic indicators with a proxy characterizing the extent of competition among commercial lenders in the firm's local geographic area.

The level of concentration in banking markets is of particular interest because small businesses tend to borrow locally, rather than nationally. A recent and continuing wave of mergers in the banking industry suggests that these local markets are becoming more concentrated. It is important therefore to understand more fully the possible implications of high levels of concentration in banking for this important class of borrowers. One reason that differences in access to credit across demographic groups could widen with lender concentration comes from Becker (1957), who showed that exercising prejudicial tastes can cut into firm profits. As such, one would expect highly competitive markets to eventually purge discriminatory behavior from the market place. In less competitive markets, however, prejudicial discrimination could be sustained in the long run. By controlling for lender market structure, we are able to test for *ceteris paribus* differences in treatment according to the level of competition faced by lenders.

To look ahead, we found no evidence that African Americans or females paid more for credit than business owners who are white males. But Hispanics paid more than others for lines of credit in less competitive lender markets. We found that African American owners who applied for credit within three years of the survey interview date were more likely than others to be denied credit. Moreover, there was some evidence that the gap in African American denial

rates increased as our measure of competition in lender markets declined. Female-owned firms also experienced increased denial rates when our measure of lender competition fell.

We found that application avoidance is a widespread phenomenon. Almost half of all small business owners that needed credit reported that they did not apply for credit sometime within the last three years because they believed that they would not be able to obtain it. These rates were even higher for female- and minority- owned businesses. Multivariate analysis reduced, but did not fully eliminate these demographic differences. When we identified these discouraged borrowers in our analysis of unmet credit needs, we found that these needs were larger for minorities than they were for whites, all else equal. But as in our denial analyses, unmet credit needs increased for African American and female owners whose businesses were headquartered in less competitive lender markets. Finally, we found that, though African Americans were less likely to apply for credit as lender market concentration increased, incorporating the decision to apply for credit into the denial analyses had little effect on the difference in denial rates between African American- and white male- owned businesses, nor did it influence the negative association between lender market concentration and access to credit in the case of female small business owners.

II. Theory and Background

The labor market literature is replete with papers on the economics of discrimination in labor markets. Most of these papers stem from Gary Becker's seminal work *The Economics of Discrimination.* In his analysis of discrimination, Becker hypothesized that individuals who have a taste for discrimination behave *as if* they were willing to pay something, either directly or in the form of a reduced income, to indulge those tastes (Becker, 1971, p. 14). Carrying this idea over to credit markets, we can envision a financial institution that would normally loan funds at rate r, requiring instead r $(1+\delta)$, where δ is the discrimination coefficient, or interest premium that must be charged, in

order to compensate for having to associate with the group for which the lender has a distaste. The discriminator will avoid making profitable loans to this group at any rate r* less than r (1+δ).

The above analysis is a simple application to interest rates of Becker's wage discrimination model. However, due to the presence of asymmetric information in credit markets, the extent to which lenders vary interest rates with the attributes of borrowers is unclear. Interest rates may therefore be the wrong place to look for discrimination (Petersen, 1981; Duca and Rosenthal, 1994). Rather, lenders may ration credit, excluding some applicants who are creditworthy at prevailing rates. If lenders act on their prejudices by turning down minorities at disproportionate rates, then denial rates would exceed expected levels after controlling for the creditworthiness of these borrowers. Stiglitz and Weiss (1981) show that in equilibrium, both credit rationing and limited rate flexibility can occur.

Critics of credit rationing argue that contractual mechanisms in the loan agreement may be available to alleviate information asymmetry concerns and mitigate the rationing problem (Besanko and Thakor, 1987; Bester, 1985; Chan and Kanatas, 1985; and Sofianos, Wachtel, and Melnik, 1990). Even so, there are other reasons that lenders might not choose to vary rates by demographic group. In particular, rate differences that inexplicably vary by demographic group could be easily detected, and lead to costly litigation, a high-risk strategy for any lender.

In the empirical literature on home mortgages, a few papers have investigated and found some evidence of disparate pricing across some demographic groups (for example, Black and Schweitzer, 1985; and Courchane and Nickerson, 1997). But most papers focus their attention instead on disparities in credit access.[2] For example, Gabriel and Rosenthal (1991) found that even after controlling for default risk, minorities were less likely to obtain conventional mortgages than were white applicants. More recently, in an attempt to include all the information available to the lender, Munnell et al. (1996) collected individual applicant information directly from financial institutions

in the Boston loan market characterizing the credit worth of the applicant. Though the evidence suggested that this information was important in the decision to grant credit, even after including it in the analysis, minorities were still more likely to be denied credit than were white applicants.

In contrast to other forms of discrimination, non-economic, or "prejudicial" discrimination as defined by Becker, is based solely on lender tastes. As Becker has shown, these tastes will come at a cost. As a result, he argues that competition should mitigate the presence of this type of discrimination over time. But more concentrated markets do not exert the same pressure for cost minimization. Thus, in the absence of competition, it may be possible to sustain non-economic discrimination.

Investigating the relationship between competition and discrimination has a long and continuing history in the labor market literature.[3] Yet most of the credit market literature does not consider the relationship between competition and discrimination, and instead estimates some variant of the following econometric model:

$$Y = \alpha + \gamma D + X'\beta + \varepsilon$$

where Y represents either denial rates or interest rates charged, X represents a vector of risk (and any other relevant) characteristics, and D represents an indicator variable for demographic group.[4] Then γ captures differences in Y due to all characteristics associated with D not captured in X. These differences may include statistical and prejudicial discrimination, as well as economic differentials not properly accounted for in the X vector. In addition to the above specification, we exploit variation in concentration across banking markets and also estimate econometric models of the following form:

$$Y = \alpha + \gamma D + \gamma' (D*HHI) + X'\beta + \varepsilon.$$

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[2] See LaCour-Little (1999) for a recent review of the evidence on discrimination in mortgage lending. For a survey of the earlier literature, see Vandell, Hodas, and Bratt (1974).

[3] Hypotheses that market power exacerbates labor market discrimination date back to Becker, 1957; Alchian and Kessel, 1962; and Comanor, 1973. For more recent work on the relation between competition and discrimination in labor markets, see Shepherd and Levin, 1973; Oster, 1975; Long, 1976; Johnson, 1978; Fujii and Trapani, 1978; Cymrot, 1985; Ashenfelter and Hannan, 1986; Shackett and Trapani, 1987; Jones and Walsh, 1991; and Peoples and Robinson, 1996; among others.

Under this specification, γ continues to capture across group differentials that can arise from a variety of sources that we expect to be invariant to market structure, including statistical discrimination, omitted variables, and (possibly) prejudicial discrimination.[5] In contrast, γ' reflects differentials associated with lender market power in the firm's local area, proxied here by HHI, the Herfindahl-Hirschman index of lender market concentration. Wider differentials in less competitive lending markets are consistent with taste-based discrimination, as posited by Becker.[6]

Variation in the level of lender market concentration arises in this cross-sectional study because small businesses tend to borrow in their local area (Elliehausen and Wolken, 1990 and 1992; Kwast, Starr-McCluer, and Wolken, 1997). Recognizing the local nature of banking markets and the importance of properly defined markets for antitrust analysis, bank regulators have devoted substantial effort to defining local banking markets and measuring lender market concentration (Ashenfelter and Hannan, 1986). We use the same market definitions and

[4] We know of only two papers that investigate the relationship between competition and discrimination in credit markets: Cavalluzzo and Cavalluzzo (1998) and Berkovec et al. (1998).

[5] Prejudicial discrimination may be present in γ if competitive markets have not yet flushed out discriminatory behavior, or if the markets we observe are not competitive enough to fully eliminate discrimination.

[6] We investigated two alternative explanations for the positive association between concentration and the size of the credit gap. Neither were validated by the data. In particular, if lenders raise the bar for all loan applicants as concentration increases, and if minority status acts as a signal for credit risk, then the gap in credit access could widen with market concentration as a result of statistical discrimination. To shed light on whether lenders increase standards as market concentration increases, we correlated the Dun and Bradstreet credit score of white applicants who obtained loans with HHI. The correlation of these two measures is -0.007 and statistically insignificant. Alternatively, if white male- owned firms have greater credit-market mobility than minorities, then those firms located in more concentrated markets may be more likely to cross over into more competitive markets in order to obtain credit or more favorable rates. Minority owners would be left behind to face higher costs or tougher lending standards. We examined the extent to which white male- owned businesses were more likely to leave their local area to obtain a loan than were businesses owned by minorities and females. We defined the dependent variable LOCAL equal to 1 if the firm's most recent loan was obtained within 30 miles of the firm's headquarters, zero otherwise, and regressed this variable on (1) the demographic variables and HHI, and (2) a set of interaction terms between HHI and demographic group, to determine the extent to which lender market concentration motivated small business owners to seek credit outside their local area. The evidence (not shown) indicated that African Americans and Asians rather than whites were statistically more likely to obtain loans outside of their local area. There was no evidence to suggest that this likelihood increased with market concentration.

concentration measures as those used in statistical studies of antitrust analysis in banking by the Federal Reserve and Justice Department.[7]

Finally, much of the literature on discrimination in mortgage lending focuses on redlining, that is, not providing loans to poor or underprivileged areas. Though the empirical evidence of redlining is mixed (LaCour-Little, 1999), if minority- owned businesses are more concentrated in such areas, and if these lending markets are also more concentrated, then a positive correlation between concentration and minority group could be evidence of redlining, rather than discrimination against a particular minority group *per se*. Although our data lack the geographic detail necessary to support exploration of redlining, a nascent research project is underway to conduct such an investigation (Bostic and Lampani, 1999).

III. Data and Descriptive Statistics

A. *Data*

We use data from the 1993 National Survey of Small Business Finances (NSSBF) to investigate some of the factors that influence differentials in the credit market experiences of small businesses across different demographic groups. The NSSBF data set is the most extensive public data set available on small businesses. These data, collected via telephone interviews by the Federal Reserve and the Small Business Administration, are intended to provide national representation on the financing experiences of small businesses in operation in the United States during 1993 and 1994. Minority groups were over-sampled in order to provide more powerful tests specifically concerning the credit market experiences of minority- owned small businesses.[8] Our final sample consists of 4,570 small businesses in operation as of 1993 and includes 1,025

[7] The HHI is based on FDIC summary of deposit data for commercial banks. Deposit data is a widely used indicator of lender market power because the ability of firms to make loans is linked directly to the level of deposits held. Both the Justice Department and the Federal Reserve use summary of deposit data to construct the HHI in antitrust analyses for the banking sector. Markets are defined as the MSA or non-MSA county where the firm's headquarters is located.

[8] All statistical tests presented in the paper control for the statistical sampling techniques employed in collecting the NSSBF data (see Methodology Report, 1996).

minority- owned businesses (431 African American-, 301 Hispanic-, and 303 Asian- owned), 816 female- owned, and 2,951 firms owned by white males.[9]

The NSSBF provides us with the firm's age, geographic location, level of employment, 2-digit SIC code, ownership and management characteristics, capital structure, income statement and balance sheet. Several aspects of the credit market experiences of these firms, as well as beliefs about the ability to obtain credit, are also contained in the data. These include whether the firm applied for a loan in the last three years, whether *and why* the owner believed that its loan request would have been rejected, the terms of the most recent loan the business received, and whether the firm was denied funding, both for the most recent loan application and for any application within the last three years.

This data set also provides several important new variables on the credit history of the owner, characteristics of the application, and costs of the loan that were not part of the original 1987 NSSBF. These variables include the amount of money requested on the loan application, points and/or fees paid to obtain the loan, the frequency with which the owner reported delinquencies on personal and/or business obligations, whether there were any legal judgments against the firm, whether the owner declared bankruptcy on any business within the past 7 years, and whether the firm had been denied trade credit. We supplement these data with business credit scores for year-end 1993 obtained by the Federal Reserve Board from Dun and Bradstreet. The credit scores, calculated and provided by Dun and Bradstreet, are intended to provide an independent assessment of each firm's credit worth. Lending institutions can purchase this information from Dun and Bradstreet and incorporate it into their decision to grant credit, just as lenders use credit scores on individuals interested in obtaining home mortgages.

B. *Descriptive Statistics*

[9] From the original total of 4,637 observations, we drop 35 minority businesses that were owned either by Native Americans or owners of mixed/multiple races, 4 that reported zero assets and 28 others that were missing data on one of several key explanatory variables. Eighteen of these observations were missing credit scores. Additionally, the final sample included 6 firms whose owners were African American and Hispanic, and 4 firms whose owners were Asian and Hispanic. The actual sample size varies with each analysis.

The NSSBF data set is a nationwide survey of small businesses (less than 500 employees) that over-sampled larger and minority- owned firms. We use weights provided in the NSSBF data set to develop population estimates of the characteristics of firms shown in Tables 1 and 2. The indicators of statistical significance shown in these tables are for a test of differences in means between each demographic group and the white male- subsample.[10] Variable definitions and model specifications are provided in Table 3.

Table 1 displays information on the borrowing experiences of small businesses. About 64 percent of businesses owned by white males had loans. Businesses owned by African American- or Hispanic- males were just as likely to have loans. But female- owned firms, and firms owned by Asians were less likely to have loans. Application rates by demographic group followed a pattern similar to that for loan holdings. African American- male and Hispanic- male small business owners applied at rates similar to those of white male- small business owners; Female and Asian owners had lower application rates.

We report percentages for two indicators of loan denials. *EverDen* measures the percentage of small business owners who applied for and were denied credit within the last three years. *DenMRL* captures denials for the most recent loan application. Table 1 shows that white males had lower denial rates than most other groups. Businesses owned by African Americans were over two-and-one-half times as likely to be denied credit within the last three years, and almost three times as likely to be denied credit on their most recent loan request than were businesses owned by white males. Hispanic- male (Asian- male) small business owners were 10.3 (12.7) percentage points more likely to have been denied credit within the last three years, and 2.7 (9) percentage points more likely to have had their most recent loan application rejected than those owned by white males. Finally, African American- males paid interest rates that were over 99 basis points or 11.1 percent higher than interest rates paid by white males. In addition to paying the lowest rates on all types of loans, white males also paid the lowest rates on lines of

[10] Standard errors and statistical significance for these statistics are calculated using 1,000 bootstrap samples. Statistics for minority- female owned businesses should be interpreted cautiously due to small sample size. Cells containing 15 or fewer observations are not reported.

credit, the dominant type of loan held by the firms in our sample. This result was statistically significant at the ten percent level. Because the preceding statistics do not control for firm characteristics and credit history, they must be interpreted with care. However, they do suggest that there were some substantial differences in credit experiences among the various demographic groups.

Table 2 provides a variety of descriptive statistics on firm and owner characteristics, credit history, and information on the firm's most recent loan. Characteristics of firms and their owners are contained in Panel A. With the exception of owner age and experience, the data tend to be skewed, as seen in comparisons of the mean and median. Within each subpopulation, there appear to be a few firms that were unusually old, large, more profitable, or with unusually high sales revenue relative to assets, and a few with unusually high debt-to-asset or loan-to-asset ratios.

A number of theories (e.g., Jovanovic, 1982) and empirical studies (e.g., Evans, 1987) suggest that firm behavior changes with firm size. Firms owned by white males were by far the largest, as measured by total assets. Hispanic- owned firms generated the highest sales and profit figures as a percent of assets, and firms owned by African American- males were somewhat less profitable than those owned by white males, measured by the median profit-to-asset ratio. Use of the debt-to-asset ratio to evaluate firm risk is widespread among commercial banks (Gibson, 1983). Median debt-to-asset ratios, as well as loan-to-asset ratios, were roughly similar across firms. The typical business in our sample is a mature firm with owners who are, on average, middle aged with substantial managerial experience. Comparisons by demographic group show that Asian and African American owners were more educated and Hispanic owners less educated than white male- owners. Minority owners were also younger and less experienced than white male- owners.

Summary statistics on firm credit history are contained in Panel B. The credit history variables indicate that the minority- owned firms, especially those of African Americans, may have been considerably more risky than others. African American small business owners have bankruptcy rates that were at least double those of white male- small business owners. African

Americans were also far more likely to be delinquent on personal or business obligations, or to have legal judgments against their firm, than were white- owned small businesses. Dun and Bradstreet credit scores were also higher (indicating superior credit worth) for white male- owned firms than for every other subpopulation, except Asian- females. Finally, Hispanic- male owners were denied trade credit more than twice as frequently as white male- owners, while African American- males were denied trade credit almost three times as often.

Panel C contains information on the characteristics of the most recent loan. Over eighty percent of the most recent small business loans came from commercial banks, and 96 percent came more generally from a financial institution. The high incidence of commercial bank use cuts across demographic groups, although it was lower (but not statistically) for small businesses owned by African American- females and Asian- males. These two groups made more use than others of financing from other businesses. Only 0.75 percent of small business owners borrowed from families and other individuals. Minority women made no use of this source, while less than 3 percent of minority men obtained their most recent loan from families or other individuals.

Strong relationships between banks and small businesses have been shown to increase the availability of funds and reduce the cost of capital to small businesses (Petersen and Rajan, 1994; Berger and Udell, 1995). Hispanic small business owners reported longer relationships with their lending institution than white owners, while owners from other minority groups reported substantially shorter relationships with lenders. Small business owners from all demographic groups were less likely than white male owners to have received originally desired terms on their most recent loan. Asian owners requested significantly smaller loans, while African Americans tended to request larger sized loans relative to assets than did white males.

The last two entries in Panel C are consistent with findings reported by other researchers who have found that small business owners borrow locally. Eighty-four percent of the most recently acquired loans came from the same city in which the headquarters of the small business resided. Moreover, the median distance between the firm and the loan granting institution was only three miles.

IV. Empirical Approach

IV A. *Analyses and Dependent Variables*

Our first analysis focuses on differences in interest rates paid across demographic groups. The dependent variable, *LOCRate,* is the nominal interest rate that the firm paid at the time of issue of the most recent line of credit.[11] Prior literature (e.g. Berger and Udell, 1995) discusses the importance of analyzing interest rates on a homogeneous set of loans. Lines of credit (LOC) are the dominant credit instrument used by small businesses and account for more than 52 percent of the most recent loans in our data set. For this analysis, the sample is limited to firms with a successful LOC application within three years of the survey interview date. All else equal, we would expect discriminatory creditors to require higher rates from borrowers for which they have a distaste. But fear of detection or, as suggested by the credit-rationing literature, fear of attracting more risky borrowers by raising rates, may lead lenders to simply "raise the bar" for particular classes of applicants. As a result, it is possible that disparate treatment may be more likely to show up in denial rates, rather than prices.

The second avenue of analysis focuses on explanations for the observed large differences in denial rates by demographic group. In this analysis, our sample is limited to firms that applied for credit within three years of the survey interview date. The dependent variable, *EverDen*, equals one if a firm was denied credit anytime within the last three years, zero otherwise. This analysis tells us if, on average, there were disparities in the ability to obtain credit among those who applied, once relevant economic considerations were taken into account.[12]

To this point, our analyses of interest rates and loan denials have been aimed at explaining the disparities in prices and access revealed in the univariate descriptive statistics presented in Table 1. But these estimated relationships are less helpful for gaining insights into disparate

[11] We also analyzed interest rates for all types of loans. Controls on the characteristics of the most recent loan (such as the prevailing prime rate at the time of the loan) were enough to eliminate the original observed differential in Table 1 between white males and all other demographic groups.

[12] We also examined the dependent variable, *DenMRL*, whether the firm was denied credit on its most recent loan application. Similar to the results for *EverDen*, African American- owned firms were far more likely to be denied credit on their most recent loan attempt than were firms owned by white males. See Cavalluzzo, Cavalluzzo, and Wolken, 1999, (hereafter, CCW) for these results.

access for the broader population of small business operators, because these initial analyses are conditional on having obtained (interest rates) or having applied for (denial rates) a loan. If lenders are more likely to discourage applications from minority-owned firms, or if minority applicants are more likely to decide not to apply for credit because they believe they would be turned down, then estimates from the previous models could understate the gap in access to credit between firms owned by minorities and white-males (Maddala and Trost, 1982; Bloom, Preiss and Trussell, 1983). The following analyses attempt to shed light on these pre-screening and self-selection issues.

Our third analysis focuses on the presence and behavior of "disc

this, we mean those small business owners who would have applied for a loan, but chose not to, because they believed that their application would have been rejected. The dependent variable used in these analyses, *FearDen*, equals one if the owner avoided applying for a loan anytime within the last three years because he or she believed that he would have been turned down, zero otherwise. This analysis explores the factors influencing a firm's fear of being turned down for credit.

In the fourth analysis, we estimate firms' unmet credit needs. *CrdNeeds* equals one if a small business owner was rejected for credit, or did not apply for credit on at least one occasion in the last three years, because he or she believed that he would have been turned down, zero otherwise. In comparison to the original denial analyses, this analysis provides a picture of the gap in unmet credit needs, taking into account all firms that desired credit sometime within the three-year reference period of the survey.

The final analysis makes use of a two-equation model that jointly estimates applications and denials. This last model provides estimates of the population-wide disparities in denial rates one could expect to observe taking into account possible prescreening and self-selection by modeling the application process generating the denial data.

IV B. *Model Specifications*

For each aspect of the credit market experiences that we examine, we compare results from four specifications of the model. The first is a baseline model that includes financial characteristics of the firms as well as bivariate demographic indicators, and a Herfindahl-Hirschman index (HHI) that controls for the degree of commercial bank concentration in the local credit market.[13] We call this a baseline model because it most closely resembles the type of model that traditionally has been reported in the literature on the economics of credit market discrimination. The second specification augments the first with eight variables on the credit history of the firm and its owner. These data are normally not available to researchers, and are an important potential source of omitted variable bias. Our third specification adds the Dun and Bradstreet credit score to the model (CREDSCR). CREDSCR is a constructed variable that ought to be highly correlated with the credit history, firm, and financial characteristics already in the model (and, in fact, may add no new information). Rather than mask the importance of these characteristics in a credit score, we chose to add the latter variable, which many lenders use to augment information gathered on loan applications, in a stepwise fashion. Having included our full set of indicators of credit risk, we next include interactions between demographic groups and market concentration in Model 4. This specification provides an opportunity to evaluate inferential evidence of heightened levels of disparate treatment in highly concentrated markets. We call Model 4 our "full specification".[14, 15]

[13] HHI data were originally on a scale from one to 10,000. We rescale this index, placing it on a zero to one scale to ease interpretability. The rescaled mean (median) value of HHI in the banking markets used by small businesses in our data set is 0.2081 (0.1817), and ranges from 0.0661 to 1.0.

[14] In a fifth specification of the model, we include the bivariate indicator DENTC, equal to 1 if the firm was denied trade credit, zero otherwise. This could help reduce omitted variable bias because it captures the independent decision of a second lender. An obvious drawback to the inclusion of DENTC is that suppliers may also behave in a discriminatory manner. Inclusion of DENTC had little effect on the demographic coefficients or their interaction with HHI (CCW, 1999).

[15] We also subject each of our analyses to a series of robustness checks. These checks include using several different criteria for sample selection (firms with less than $10 million in sales, firms located only in MSAs, and firms with less than $10 million in sales and located only in MSAs), a bivariate specification of lender market concentration (where HHI > 0.18 indicates a concentrated market), and unweighted data. Results from our robustness tests are discussed in footnotes. For a complete presentation of these checks, see CCW (1999).

IV C. *Statistical Controls*

One of the strengths of the NSSBF data sets is the vast amount of information they contain on both credit market participants and potential participants (that is, firms that chose not to apply for credit). We use the 1993 NSSBF data to control for personal characteristics of the principal owner, financial and other characteristics of the firm, credit history of the firm and its owner, information about market conditions at the time of the loan, and points and or fees paid to obtain the loan.[16] We supplement these data with information made available to us by the Board of Governors of the Federal Reserve System on the credit scores assigned by Dun and Bradstreet to the small businesses in our sample and the level of competition in the credit markets used by these small businesses. Table 3 contains all variable definitions, in addition to model specifications for each of our analyses.

V. Results

V A. *Interest Rate Analysis (LOCRate)*

Results from our interest rate analysis are presented in Table 4.[17] Model 1 includes 57 controls describing the characteristics of the most recent line of credit, firm and owner characteristics, information on the financial institution, the firm's relationship with the institution, industry and region. The model explains 29 percent of the variation in interest rates charged. All else equal, we found no evidence that rates varied across demographic groups. Key determinants of the interest rates firms paid were current market interest rates, as embodied in the index of relevant interest rates at the time of the most recent LOC (MRL_INDX), the size of the LOC (LNAMTBRR), whether the LOC was from a financial institution, and the firm's debt-to-asset ratio (higher debt-to-assets were associated with higher rates). Interestingly, almost none of the owner characteristics (not shown) added any explanatory power to the model. Wald tests on the

[16] For the interest rate, denied, and applied equations, length of relationship and firm age are adjusted to reflect the value of these variables at the time of the loan application.

[17] The models are estimated using sampling weights and stratification consistent with the sampling methods employed in collecting the NSSBF data (See Methodology Report, 1996). Coefficients for variables not presented in the table are available from the authors by request (also see CCW, 1999).

group of variables representing owner characteristics are not jointly significantly different from zero.[18]

Model 2 adds eight additional controls to Model 1 describing the credit history of the firms and owners. A Wald test rejected the joint significance of these eight variables' ability to help explain variations in interest rates. Taken together, these results lend some credence to Stiglitz & Weiss' adverse selection hypothesis. While market interest rates, lender characteristics, and other loan characteristics played a strong role in determining interest rates charged, so far, there is only limited evidence that owner and credit history measures played a role in explaining interest rates.

Model 3 adds credit score to the previous model. The coefficient on CREDSCR is statistically significant at the one percent level. A one standard deviation improvement in credit score is associated with a twenty basis point decrease in the interest rates firms paid. In contrast to most of the other credit history information, the Dun & Bradstreet credit score provides at least some evidence of interest rate flexibility with firm credit history.

Model 4 presents our results with interactions between HHI and each demographic group. The HHI interaction with African American, though positive, is statistically insignificant. However, there is some evidence that interest rates paid by Hispanic- owned firms increased with increases in lender market concentration. This result is significant at the 5% level. A one percentage point increase in HHI translates into an 11.40 basis point increase in the price Hispanics paid for lines of credit. In the median market for Hispanic owned firms, Hispanics paid about the same as firms owned by white males. In contrast, Hispanic- owned firms located in the

[18] These variables include owner education, experience, whether the owner was responsible for the day-to-day activities of the firm, and the ownership share of the principal owner.

90th percentile of lender market concentration paid 69 basis points more on lines of credit than their white male- counterparts.[19]

In sum, we find no evidence that African American-, Asian-, or female- owned businesses paid more for credit than firms owned by white males. Although the gap in rates paid by Hispanics for lines of credit increased with concentration, on the whole, the results appear to be more consistent with Stiglitz & Weiss' adverse selection hypothesis. That is, apart from the Dun & Bradstreet credit score and the liabilities-to-asset ratio, there was little evidence that interest rates varied with borrower attributes.

V B. *Denial Analysis (EverDen)*

Our analysis of the determinants of whether the firm was denied credit anytime within the last three years is summarized in Table 5. In contrast to the interest rate results, the denial models demonstrate the importance of credit history for the ability of firms to obtain financing, and for the estimated size of observed differentials by demographic group. Model 1, which incorporates 44 control variables, but omits firm and owner credit history, leads to a large and highly significant coefficient for African Americans; all else equal, these firms were more than twice as likely to be denied credit than their white male- counterparts. The predicted probability of credit denial at least once in the last three years is 56.4 percent if all firms are treated as African American- owned, compared to a prediction of 27.1 percent if the same firms had been owned by white males.[20] The addition of 8 indicators of credit history reduces the African American coefficient, and the predicted probability of African American denial rates to 48.80 percent. The

[19] Because the distribution of businesses across concentrated lender markets differs somewhat by demographic group, we evaluate the predicted effect of market structure on credit access at competitive, median and concentrated market levels that pertain to each group. Lender market concentration (HHI) is 0.09 at the 10th percentile for Hispanic- owned firms, 0.16 at the median level, and 0.23 at the 90th percentile. Concentration is 0.09, 0.16, and 0.25 at the three evaluation points for African Americans, and 0.11, 0.20 and 0.35 at these points for white female owners.

[20] Probability estimates are computed for each observation in the sample, assuming the observation has the characteristic of interest. In this case, they are computed twice, first assuming every observation in the sample is a firm owned by an African American- male and second assuming every observation in the sample is a firm owned by a white male. Unless otherwise stated, all race and ethnicity predictions pertain to males; female predictions refer to firms owned by white females.

addition of the Dun and Bradstreet credit score reduces the predicted probability further to 47.3 percent (Model 3).

Firms owned by Asians were also significantly more likely to have been denied credit than firms owned by white males. From Model 1, the predicted probability of denial under Asian ownership, at 38.3 percent, is about ten percentage points higher than the predicted denial rate for white males. The inclusion of the credit history variables in subsequent models has little effect on the size of the Asian coefficient, but renders it statistically insignificant.

In all, 5 of the 8 credit history indicators were statistically significant at commonly accepted levels. Owners that had declared bankruptcy sometime in the past 7 years and those with judgments against them were statistically more likely to be denied credit than others. While it appears that creditors were willing to accept the risk associated with up to two delinquencies on the personal obligations of small business owners, having three or more personal delinquencies increased the probability of being denied credit from 27 to 45 percent. In contrast, missing one business obligation did not appear to increase the likelihood of being denied credit, but missing a second increased the probability of denial from 28 to 44 percent. The D&B credit score is also highly significant. A one standard deviation increase in CREDSCR reduces the predicted probability of denial for any particular applicant by more than 4 percentage points, or by about 14 percent.

The addition of the HHI interaction terms in Model 4 provides important insights into the treatment of different demographic groups across lender market structure. The coefficient on AFAM now approaches zero, but the interaction of AFAM with HHI is large and significant at the five percent level. The coefficient on the interaction between FEMALE and HHI is positive and significant at the one percent level. Consistent with Becker's theories of discrimination, both results indicate that denial rates were higher relative to rates for firms owned by white males as concentration rates rose in small business credit markets.[21] Due to the continuous nature of HHI,

[21] Robustness checks on Model 4 using just the smallest firms in our sample (those with less than $10 million in sales) and firms located only in MSAs corroborated the results in Table 5. The coefficients on the HHI interaction with African American were large, positive, and in the small firm sample, statistically significant at the 5 percent

and the non-linearity of the logit specification, we offer insight into the influence of bank market structure on denial rates by predicting the probability of denial for each observation at the tenth, fiftieth, and ninetieth percentiles of HHI under alternative assumptions about the demographic group of the owners.[22] The predicted probability of denial for firms if owned by white versus African American males at the competitive evaluation point was similar: 0.32 and 0.39, respectively. In contrast, the predicted probability of denial in the least competitive markets was 0.27 if firms were owned by white males, compared to 0.55, if firms were owned by African Americans.[23]

The estimated probability of loan denial rates for female- owned firms also increases with lender concentration. At the tenth percentile of HHI for females predicted denial rates were 0.21 if all firms were assumed to be female- owned, versus 0.31 if firms were owned by white males. At the ninetieth percentile, predicted denial rates were 0.37 for female- owned firms versus 0.23 for firms owned by white males.

V C. *Application avoidance (FearDen)*

The previous analyses examined interest rates and denial rates given the firm had a loan or applied for credit, respectively. Those analyses are useful for explaining raw differences observed in the data and for characterizing the experiences of firms that actually applied for, or received credit. However, if minority- or female- owned firms were less likely than white male- owned firms to apply for credit for fear of being turned down, then the results presented so far may understate disparities in the credit needs of these businesses. This section examines two issues involving application avoidance. First, to what extent do firms refrain from applying for credit

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level. The coefficients on FML*HHI were large, positive, and statistically significant in both subsamples. Furthermore, the joint effect of AFAM and AFAM*HHI (FEMALE and FML*HHI) was significant at the 1% (10%) level in the MSA sample and the 1% (1%) level in the small firm sample. Point estimates for the probability of denial for both groups at varying level of market concentration were similar to those reported for the full sample.

[22] The Department of Justice and Federal Reserve System use 0.18 as their concentrated market indicator for merger analyses, potentially rejecting merger applications in situations which create a Herfindahl index exceeding 0.18. As such, we also provide predicted probabilities of denial for each demographic group at this level of concentration.

[23] And at the Department of Justice cutoff of 0.18, the differences in the probability of denial were 0.28 vs. 0.50 for white male- and African American- owned firms, respectively.

because they expect to be turned down; and second, what are the factors influencing a firm's fear of applying for credit? The next section incorporates this information and estimates the expressed unmet credit needs of firms across demographic groups.

Table 6 presents descriptive statistics on firm demand for credit and owner expectations concerning the ability to obtain credit. Over the past three years, about 50 percent of firms demonstrated a need for credit, either by applying for a loan or reporting that they did not apply because they did not think they would be able to obtain credit. Among all demographic groups, African Americans displayed the greatest desire for credit (79 percent for females and 70 percent for males) followed by Hispanics, Whites, and Asians.

Of the firms that expressed a need for credit, fully half reported that they did not apply for credit sometime within the last three years because they did not expect to be able to get credit. These "fear" rates ranged from between 45 and 50 percent for white- owned businesses, to the low 60s for businesses owned by Hispanic- and Asian-males and to the mid 80s for African American- and Hispanic female- owned businesses. Looking at the distribution of reasons for believing that their application would be rejected, we find that poor credit history or firm financial conditions were by far the leading reasons, with close to 60 percent of owners citing these explanations. In addition, about 20 (13) percent of African American-males (females) cited prejudice as a reason that they anticipated rejection of a loan application. Few members of other demographic groups cited prejudice.

We use logit analysis to examine the factors, among those who needed credit, that influenced the decision not to apply for a loan because the firm feared denial (Table 7). All else equal, we find that African American- and Hispanic- business owners were far more likely to have avoided applying for credit than were white male- owners, after controlling for financial characteristics of the firm. Coefficients from Model 1 imply that African American owners were almost 53 percent more likely, and that Hispanic owners were almost 27 percent more likely to have avoided applying for a loan due to fear of denial, than were businesses owned by white

males.[24] Inclusion of credit history controls and the credit score (Models 2, 3) reduces these differences somewhat, but African American owners were still about 37 percent more likely, and Hispanic owners were 23 percent more likely, to have avoided applying for credit when these variables are taken into account.

A number of factors proved to be important in influencing the firm's fear of being turned down for credit. Among financial characteristics, firms with a larger asset base and those with greater sales relative to assets were important determinants in reducing a firm's fear of denial. The firm's self-reported credit history variables, and the Dun and Bradstreet credit score were also important indicators influencing a firm's fear of denial. Firms with superior credit history or a higher credit score were less likely to fear denial.

We add interaction terms between market concentration and demographic variables in Model 4. While the Hispanic coefficient (HISPAN) is still large and significant, the African American coefficient (AFAM) is now insignificant, although it is jointly significant with AFAM*HHI. FEMALE interacted with lender market concentration (FML*HHI) is positive and statistically significant, indicating that, as lender markets became more concentrated, female-owned firms were more likely to have avoided applying for a loan because of fear that their application would be rejected.[25]

V D. *Unmet credit needs (CrdNeeds)*

Our analyses so far uncovered substantial differences in denial rates between African American- and white- owned firms, with some evidence that differences for female- and African American- owned firms increased with increases in lender market concentration. However, we also found that African American- and Hispanic-, along with weaker evidence that female- owned firms located in more concentrated lending markets, were more likely to have avoided applying for credit because they anticipated having their loan application rejected. The increased

[24] In model 1, the predicted probability of not applying for credit at least once over the past three years due to fear of denial, given the characteristics of firms in the sample, is 47.98 percent if all firms are treated as white males. Predicted levels of application avoidance rise to 73.36 (60.87) percent if these same firms are treated as African American (Hispanic) males.

propensity of these groups to avoid applying for credit suggests that the denial results presented previously may understate the overall effect of demographics on credit access for some groups.

To address this issue, the dependent variable employed in this analysis (similar to *EverDen)*, includes those "discouraged borrowers" that did not apply for credit for fear of being turned down. That is, *CrdNeeds* is set to one for all firms that were denied credit anytime within the past three years, or did not apply for fear of being turned down, zero otherwise. Firms that did not express a need for credit are excluded from this analysis. We interpret this dependent variable as whether a firm had any unmet credit needs.

Logit estimates for the factors influencing whether the firm had any unmet credit needs are presented in Table 8. The coefficients in Columns 1-3 suggest that African American-, Hispanic-, and Asian- owned firms are more likely than those owned by white males to have unmet credit needs. (In contrast, the *EverDen* results only uncovered statistically significant differences in denial rates for African Americans and, to some extent, Asians.) Based on Model 1, if African Americans owned all firms, unmet credit needs would be 22.7 percentage points higher than they would be if these same firms were owned by white males. Hispanic or Asian ownership would result in unmet credit needs that are from 23 to 26 percent higher than they would be under white male- ownership. The addition of the eight credit history variables and the Dun & Bradstreet credit score reduces the differential for African American- owned firms to 16.7 percentage points; however, there was little change in the probability levels for Hispanics and Asians.

Inclusion of the HHI interaction terms (Model 4) demonstrates that, for firms owned by African Americans and females (but not Hispanics or Asians), the differentials became more pronounced as our measure of lender market concentration increased. Predicted probabilities of *CrdNeeds* in concentrated markets for African American firms were 0.73 compared to 0.47 for firms owned by white males. While the estimated probabilities of *CrdNeeds* are by construction higher than the corresponding denial rates observed in the previous analysis, the difference in the

[25] This result was robust to excluding the largest firms from our sample. When restricting the firms to just those located in MSAs however, the coefficient, though still large, was insignificant.

probability levels between African Americans and white males in each analysis is remarkably similar. The difference in the probability of denial (*EverDen*) is 29 percentage points compared to 26 percentage points for *CrdNeeds*, suggesting that the estimated effect of market structure on disparate access was largely insensitive to applicants not applying for fear of being turned down. Predicted unmet credit needs in concentrated markets for female- owned firms were 58.2 percent compared to 44.6 percent if firms were owned by white males.[26] The difference between predicted denial rates and predicted unmet credit needs for white male- and female- owned firms is about 14 percentage points in the two analyses.

V E. *Joint Estimates of Application and Denial*

Section V.B examined factors to help explain the original raw differentials in denials observed across different demographic groups. The following section (Section V.C) uncovered evidence consistent with self-selection on the part of applicants (i.e., not applying for fear of being turned down). This suggested that the results of our denial analyses may have understated a firm's credit needs, which was found to be true in the following section, Section V.D. Normally researchers do not have an opportunity to correct for selection bias through inclusion of the formerly omitted observations as we did in our analysis of firm credit needs. Instead, the traditional approach is to make an econometric correction to account for these missing observations. In the present section, we extend the analysis to the entire population of small businesses by specifically modeling the data generating process of the accept/reject decision.

Suppose that the decision to apply for credit is based on both observed and unobserved characteristics.[27] Also assume that some group (call it group A) has more of the unobserved factors which increase its members' probability of applying for credit. Then the other group (call it group B) will be less likely to apply for credit than group A with the same observed characteristics. As such, those individuals from group B who actually applied will have above average amounts of the unobserved characteristics. If these unobserved characteristics also

[26] These HHI levels reflect the 90th percentiles for African American-male and white female- owned firms respectively.

[27] This and the following paragraph are based primarily on the discussion in Bloom, Preiss, and Trussell (1983).

influence the lender's decision to extend credit (suppose positively), the probability that an application is accepted will be positively associated with group B membership, even though such group membership does not explicitly enter into the lender's decision function. As such, if the lender has a discriminatory ranking function such that group B membership increases the likelihood of rejection, the selection of "above average" applicants from group B suggests that our denial analysis may understate the degree of differences if the application process is ignored.

Consider the following scenario:

$$S_i = Z_i b_S + e_{Si} \qquad (1)$$

$$A_i = X_i b_A + e_{Ai} \qquad (2)$$

where $S_i > 0$ if a potential applicant becomes an active applicant ($S_i \le 0$ otherwise), $A_i > 0$ if the application is accepted ($A_i \le 0$ otherwise), and Z and X are vectors of covariates with associated parameter vectors b_S and b_A. Assuming that e_{Si} and e_{Ai} are bivariate standard normally distributed with correlation coefficient r and cumulative distribution function Φ_2, the likelihood for a sample of independent observations is:

$$\prod_{i=1}^{N_1} \Phi_2(X_i b_A, Z_i b_S; \rho) * \prod_{i=N_1+1}^{N} \Phi_2(-X_i b_A, Z_i b_S; \rho) * \prod_{i=N+1}^{M} \Phi\ (-Z_i b_S) \qquad (3)$$

where the first N_1 observations have $S_i = A_i = 1$ (firm applied and was approved credit), the following $N - N_1$ observations have $S_i = 1, A_i = 0$ (firm applied but was denied credit), and the remaining $M - N$ observations have $S_i = 0$ (firm did not apply for credit). Equation 3 can be estimated using standard techniques for maximum likelihood estimation (Bloom, Preiss, and Trussell, 1983; Van de Ven and Van Pragg 1981).

Models such as those in (3) require identification in order to be properly estimated. Often one appeals to the nonlinearity of the model for identification (Bloom, Preiss, and Trussell, 1983). However, under the null hypothesis of no differences in denial rates across demographic groups, if self-selection really is a concern, then the race variables would be correlated with applications, but

not denials. If this is the case, then the race variables themselves provide the necessary instruments needed for identification.

Results

Table 9 presents coefficients from a bivariate probit model of our denial analysis using the decision to apply for credit as our selection equation. Because the application information is for the most recent loan, we only include denials on the most recent loan attempt (i.e., *DenMRL)*. The correlation between the application decision and *DenMRL* is positive ($\rho = 0.09$) and statistically significant, indicating that even though the selection equation did little to influence the level of statistical significance of AFAM (Column 2), it may have influenced the implied probabilities. First, Column 1 suggests that Asians, but not other groups, were less likely than white males to apply for credit. Assuming all firms behave as Asian- owned firms, the predicted probability of applying for credit is 27 percent versus 35 percent for white males. Turning to denials, the coefficient on AFAM is statistically significant at commonly accepted levels of significance ($p= 0.016$). This coefficient value translates into a 24 percent probability of denial if all firms are treated as African American- owned, versus a 16 percent probability of denial if all firms are treated as white male- owned. These estimates are very similar to the predicted probabilities obtained when *DenMRL* is estimated without the application equation (not shown). This result is somewhat surprising considering the importance of this information in the model of credit needs (see Section V.D).

Results including the HHI interaction terms are presented in Columns 3 and 4. The correlation between the error terms of the two equations is negative ($\rho = -0.49$) and statistically significant. From the application equation, we see that including the HHI interaction terms uncovers some very interesting results. First, it is still the case that Asians are less likely to apply than are white males. This result is unrelated to lender market structure. However, it is also the

case that African American application rates decline as lender market concentration increases. This result is statistically significant at the five percent level. In the median market for African American- owned businesses, application rates for African Americans are 36.5 percent, versus 35 percent for white males, while at the 90th HHI percentile the African American application rate is 32.5 percent versus 35 percent for white males. Thus, while the white male application rate was invariant to market structure, African American application rates appear to decline with increases in market concentration. Turning to the denial equation, we note that despite the high correlation between the two equations, the implied probabilities and coefficient estimates are remarkably similar to the results estimated without the selection equation. Though the coefficient on the AFAM*HHI interaction term is large, it is statistically insignificant ($p = 0.13$). However, the joint significance of AFAM*HHI is significant at the 5% level. Further, the coefficient on FML*HHI is statistically significant at the one percent level. Female denial rates are roughly similar to those of white males at the median HHI value for females, 0.31 versus 0.29, respectively, while at the 90th HHI percentile female denial rates increase to 45 percent versus 27 percent for white males. Finally, there is no evidence that Asian denial rates increased with lender market concentration. Surprisingly, the coefficient on ASN*HHI is negative and statistically significant.

In sum, adding the selection (application) equation did little to influence our denial estimates, but did uncover some interesting behavior in application rates. African American application rates decreased as lender market concentration increased. Asians were statistically less likely to apply for credit than were white males, but this result was invariant to lender market structure. Further, the estimated probabilities from the denial equation mirrored those without the selection equation. There was some evidence that African American denial rates increased with concentration, though this result was not estimated with much precision. There was, however,

both statistical and economic significance that female denial rates increased with lender market concentration, but no evidence that these rates increased for Asians or Hispanics.

VI. Conclusions

We found evidence of substantial differences across demographic groups in many of the small business credit market experiences we examined, even after controlling for a broad set of characteristics on the firm and owner. We also found that African American and female experiences were often correlated with the level of lender market concentration faced by small firms. Small businesses that were owned by African Americans were more likely to be denied credit and have unmet credit needs as the level of lender market concentration increased. In addition, African American owners were less likely to apply for credit with increases in lender market concentration. The latter finding suggests that a feedback effect may be exacerbating the detrimental effects of market concentration by limiting applications for credit from African American owners. However, we did not observe statistical significance on the HHI interaction term in the denial equation when we examined the joint estimation of applications and denials, though the joint effect of AFAM and AFAM*HHI was still significant.

We found more robust evidence of a widening gap in credit access between white male and female-owned firms. Female denials increased with lender concentration. This result was maintained in several sensitivity tests. We also found evidence that concentration increases female fears of credit denial and credit needs.

But does the evidence suggest unambiguously that prejudicial discrimination is the cause of the observed relationships? Although we have found some evidence that is consistent with prejudicial behavior, other factors could also explain these results. Consider first omitted variables. Although our data set is extremely rich, we have no direct information on the owner's personal wealth, even though this factor may play an important role in the decision of lenders to extend credit. However, it is well known that personal wealth is highly correlated with a person's education, experience, and for small businesses in particular, the assets of the business, and these variables are included in the models. Further, though this omission may help reduce the

unexplained differential between white and African American denial rates, it is less likely to bias the interaction terms between market structure and demographic group, since personal wealth would have to be correlated with concentration in lender markets to have such an effect. We have no reason *a priori* to anticipate such a correlation.

The observed concentration effects could also arise from statistical discrimination if minority group signals greater credit risk *and lenders change their behavior,* raising the bar for all applicants in more concentrated markets. If this is the case, then demographic effects could work through the concentration interaction term. But in a test of such behavior, we found no correlation between the credit score of white applicants who obtained loans and concentration, suggesting that lenders do not raise the bar across the board as concentration increases.

The gap in denials could also widen *if small firms change their behavior* as lender concentration increases. Suppose, for example, that credit is more costly, or more difficult to obtain, in concentrated markets. Suppose too that white owners have greater credit-market mobility than minorities. Then whites who have businesses that are headquartered in concentrated lender markets might be more likely than others to cross into more competitive lender markets in order to obtain credit. Minority owners would be left behind to face higher costs or tougher lending standards. Since white-owned firms are older and larger, and language or cultural constraints may impede the mobility of minorities, such a scenario seems plausible. But our limited evidence of such behavior doesn't support the hypothesis. We found that most loans are obtained locally and that minorities, rather than whites, are more likely to seek credit outside of their local area. Moreover, we found no evidence that distance to lender was correlated with lender concentration.

In sum, we observed substantial, ceteris paribus differences in denial rates between African American and white male owned firms. These differences were robust to estimation of alternative selection models. We also found evidence of a role for market concentration in explaining some of the differentials. Although the evidence of disparate access associated with lender market concentration is mixed, and the cause of the observed disparities are ambiguous, we conclude that

there is not enough evidence to eliminate discrimination as a potential explanation for some of the observed differences.

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Table 1: Borrowing Characteristics of Small Businesses by Demographic Group – Population Estimates

Means (Number of observations in parentheses)

	All	White		African American		Hispanic		Asian	
		Males	Females	Males	Females	Males	Females	Males	Females
Percent with loans (*Loan*)	62.24 (4,570)	63.70 (2,951)	58.55* (594)	64.50 (336)	51.39* (95)	63.20 (236)	53.08 (65)	54.48* (238)	47.35* (65)
Percent applied (*Apply*)	34.50 (4,570)	35.95 (2,951)	31.55 (594)	36.71 (336)	28.09 (95)	35.96 (236)	12.67* (65)	25.86* (238)	16.97* (65)
Percent denied within last three years (*EverDen*)	28.67 (1,985)	26.04 (1,418)	30.33 (225)	68.54* (134)	52.46* (31)	36.29 (82)	33.72 (16)	38.76 (66)	-
Percent denied on most recent loan (*DenMRL*)	18.45 (1,985)	16.01 (1,418)	22.99 (225)	49.15* (134)	37.26* (31)	18.72 (82)	12.62 (16)	25.01 (66)	-
Average interest rate on most recent loan (*IntRate*)	8.77 (1,682)	8.72 (1,265)	8.78 (189)	9.71* (70)	9.27 (18)	9.13 (68)	-	9.03 (52)	-
Average interest rate on most recent LOC (*LOCRate*)	8.41 (1001)	8.33 (780)	8.65 (98)	8.38 (39)	-	8.56 (34)	-	9.11 (30)	-

NOTES:

1. Population estimates weighted to reflect differences in sample selection and response rates (see Methodology Report, 1996).
2. An * signifies that the statistic is significantly different from the white male- owned firm value at the 95 percent level of confidence. Standard errors for these tests are calculated using 1,000 bootstrap sample and weight replicates.
3. A "-" signifies that statistics were not reported because the sample size (N) was 15 observations or less.

Table 2 – Descriptive Statistics: Means (Medians in parentheses)

	All	White		African American		Hispanic		Asian	
		Males	Females	Males	Females	Males	Females	Males	Females
Panel A: Firm and Owner Characteristics									
Assets (000)	490	590	220*	190*	90*	370	140*	410*	340
	(70)	(80)	(50)*	(50)*	(20)*	(60)	(30)*	(70)	(60)
Sales/assets	6.16	6.24	5.94	6.01	5.96	5.66	8.85	6.03	3.59*
(SALEASST)	(2.96)	(2.99)	(2.88)	(2.78)	(2.61)	(3.18)	(3.72)	(3.00)	(2.20)
Profit/assets	0.97	1.01	0.80	0.75	0.91	1.09	1.30	1.25	0.37*
(PROFASST)	(0.21)	(0.21)	(0.19)	(0.19)	(0.04)*	(0.59)*	(0.46)	(0.28)	(0.07)
Debt/assets	0.63	0.62	0.61	0.93	0.69	0.58	0.71	0.72	0.47*
(LIABASST)	(0.47)	(0.48)	(0.47)	(0.48)	(0.43)	(0.43)	(0.50)	(0.50)	(0.41)
Loan/assets	0.40	0.41	0.38	0.38	0.43	0.38	0.44	0.39	0.33
	(0.25)	(0.26)	(0.23)	(0.20)	(0.21)	(0.21)	(0.25)	(0.30)	(0.13)
Firm age (years)	14.34	15.26	12.42*	12.64*	10.22*	12.62*	10.75*	9.24*	11.26*
	(11)	(12)	(9)*	(10)*	(7)*	(10)*	(8)*	(8)*	(9)
Owner age (years)	49.46	50.16	47.91*	49.56	46.74*	47.49*	45.50*	45.83*	48.18
	(48)	(49)	(46)*	(48)	(44)*	(47)	(45)	(45)*	(46)
Owner experience (years)	18.93	20.37	15.29*	16.75*	12.54*	16.15*	12.88*	14.51*	15.11*
(EXPER)	(17)	(19)	(14)*	(15)*	(10)*	(15)*	(10)*	(14)*	(14)*
Percent not finishing high school *(NOT_HS)*	4.49	4.72	2.20*	3.92	1.19*	12.18*	5.37	5.48	3.38
Percent with some college *(COLLEGE)*	71.99	71.50	73.48	79.90*	87.85*	61.40*	49.09*	81.59*	85.32*

Table 2 (Continued)

	All	White		African American		Hispanic		Asian	
		Males	Females	Males	Females	Males	Females	Males	Females
Panel B: Credit History									
Percent declared bankruptcy within past 7 years *(BANKRUPT)*	2.20	2.27	1.45	5.33*	4.40	1.40	5.03	2.53	0.00*
Percent with judgments *(JUDGMENT)*	4.91	4.48	3.96	14.80*	15.50*	7.72	14.58	6.44	0.00*
Percent delinquent on personal obligations (3 or more times) *(PDELINQ3)*	8.02	7.25	7.60	22.41*	17.67*	12.02	26.33*	4.17*	10.70
Percent delinquent on business obligations (3 or more times) *(BDELINQ3)*	11.71	10.90	13.68	19.75*	14.65	16.68	12.43	7.81	7.03
D & B Credit Score	50.12	51.81	47.57*	35.86*	42.15*	43.66*	45.00	44.63*	52.77
(Range: 1-100) *(CREDSCR)*	(47)	(50)	(41)*	(31)*	(39)*	(39)*	(39)*	(39)*	(50)
Percent denied trade credit	6.13	5.27	7.09	14.94*	9.82	11.74*	5.41	8.11	5.55
Panel C: Most Recent Loan									
Percent from commercial bank	80.58	81.23	79.86	75.36	63.02	82.35	79.78	68.99	--
Percent from financial institution (including commercial banks)	95.97	95.87	98.18	91.79	84.10	94.22	100.00*	90.61	--
Percent from government institution	0.51	0.31	0.61	3.95*	5.89	1.23	0.00	1.31	--
Percent from other businesses	2.78	3.12	0.77*	1.99	10.02	1.67	0.00*	8.08	--
Percent from family or individuals	0.75	0.70	0.44	2.27	0.00*	2.88	0.00*	2.91*	--
Length of relationship with institution	6.80	7.28	4.96*	4.80*	2.78*	8.36	8.69	4.70*	--
at time of application	(4)	(5)	(3)*	(3)*	(2)*	(5)	(8)	(3)*	--
Percent receiving less desirable terms than originally requested	9.40	8.41	11.95	20.12*	14.07	14.05	--	13.03	--
Dollar value of loan request	1.05	1.10	0.75	2.13	1.41	0.75	0.41*	0.54*	--
relative to assets *(J5_ASST)*	(0.30)	(0.29)	(0.33)	(0.45)*	(0.47)	(0.30)	(0.25)	(0.29)	--
Percent of firms located in concentrated banking markets *(HHI)*	50.61	51.23	55.13	37.67*	44.38	37.63*	42.60	39.16*	41.26
Percent with most recent loan institution in same city	84.13	84.91	82.98	82.86	74.83	82.04	100.00*	67.04*	--
Distance (miles) between firm and	50.68	45.81	57.73	46.26	78.08	22.27*	--	234.54	--
institution with most recent loan	(3)	(3)	(2)	(4)	(9)	(4)	--	(6)	--

NOTES:

1. An * signifies that the statistic is significantly different from the white male- owned firm value at the 95 percent level of confidence. Standard errors for these tests are calculated using 1,000 bootstrap sample and weight replicates. All estimates are weighted to reflect population averages.
2. A "-" signifies that statistics were not reported because the sample size (N) was 15 observations or less.

Table 3
Variable Definitions and Model Specifications

Variables	Definitions	Analysis[a]					
Dependent Variables		(1)	(2)	(3)	(4)	(5)	(6)
LOCRate(IntRate)	Initial nominal interest rate on the firm's most recent line of credit (all loan types).	X					
EverDen	Indicates whether any lender turned down a request for credit from the firm within the last three years. Defined only for those firms that applied for credit in the past 3 years.		X				
FearDen	Indicates whether there were times in the last three years that the firm did not apply because it thought it would be turned down. Defined only over those firms that either applied for credit in the past 3 years, or did not apply for fear of denial.			X			
CrdNeeds	Equal to one if the firm was ever denied credit or did not apply for fearing denial, zero otherwise. Defined only for those firms that either applied for credit in the past 3 years, or did not apply for fear of denial.				X		
Apply	Indicates whether during the last three years the firm applied for credit or asked for a renewal of terms on an existing loan.					X	
DenMRL	Indicates whether the firm was denied its most recent loan request. Defined only for those firms that applied for credit in the past 3 years.						X
Independent Variables							
HHI	Herfindahl-Hirschman index of market concentration derived from FDIC summary of deposit data.	X	X	X	X	X	X
Credit History and Credit Score							
BANKRUPT	Indicates whether the firm's principal owner declared bankruptcy within the last seven years.	X	X	X	X	X	X
JUDGMENT	Indicates whether any judgments have been rendered against the principal owner within the past three years.	X	X	X	X	X	X
PDELINQ1 (2, 3)	Indicates whether the firm's principal owner was 60 or more days delinquent on personal obligations 1 time (2 times, 3 or more times) within the last three years (0 times omitted).	X	X	X	X	X	X
BDELINQ1 (2, 3)	Indicates whether the firm's principal owner was 60 or more days delinquent on business obligations 1 time (2 times, 3 or more times) within the last three years (0 times omitted).	X	X	X	X	X	X
CREDSCR	Credit score percentile, created by Dun & Bradstreet.	X	X	X	X	X	X
Owner Characteristics							
NOT_HS (COLLEGE)	Indicates whether the firm's principal owner is a non-graduate of high school (has some college; high school omitted).	X	X	X	X	X	X
EXPER	Number of years of experience that the principal owner has had owning or managing a business.	X	X	X	X	X	X
MANAGE	Indicates whether the firm is managed on a daily basis by the owner or a partner.	X	X	X	X	X	X
OWNSHR	Percentage of the firm that is owned by the principal owner.	X	X	X	X	X	X
Firm Characteristics							
ASSETS	Natural log of total assets (in millions of dollars).	X	X	X	X	X	X
EMPLOY	Natural log of the total number of employees.	X	X	X	X	X	X
SALEASST	1992 Sales / Total assets.	X	X	X	X	X	X
LIABASST	Total short and long term debts / Total assets.	X	X	X	X	X	X
PROFASST	Operating Profits / Total assets.	X	X	X	X	X	X
LNAGE (LNAGE2)	Natural log of firm age at the time of the survey (most recent loan application).	(X)	(X)	X	(X)	X	(X)

Table 3 (Continued)

Variables	Definitions	Analysis					
Firm Characteristics (continued)		(1)	(2)	(3)	(4)	(5)	(6)
CCORP (SCORP, PARTNER)	Indicates whether the firm was a c-corporation (s-corporation, partnership). Proprietorship omitted.	X	X	X	X	X	X
FRANCHIS	Indicates whether the firm was a franchise.	X	X	X	X	X	X
NATN (OUTSD, REG)	Indicates whether the firm's primary sales or delivery of products are throughout the United States (outside the United States, within the same geographic region, or in the same local area (omitted)) as the firm's main office.	X	X	X	X	X	X
MSA	Indicates whether the firm's headquarters are located in an MSA (MSA=1) or rural area (MSA=0).	X	X	X	X	X	X
Financial Institutions/Product Characteristics							
FIN_JBNK	Indicates whether the firm's most recent loan application was to a financial institution.	X					X
REL_JBNK	Number of years that the firm has been conducting business with the institution where the firm applied for its most recent loan (set to zero if the firm did not have a relationship with the most recent lending institution).	X					X
PRIM_FIN	Indicates whether the firm's primary institution is a financial institution.		X	X	X		
REL_PRIM	Number of years the firm has been conducting business with its primary institution (set to zero if the firm has no primary institution).			X			
REL_PRIM2	Number of years firm has been conducting business with its primary institution at the time of the most recent loan (set to zero if the firm has no primary institution).		X		X		
LEND_SRC	Number of distinct lending sources used by the firm for lines of credit, equipment loans, motor vehicle loans, mortgage loans, capital leases, or other loans.	X					X
SOURCES	Number of institutions that the firm uses for all financial services.		X	X	X	X	
TCUSE	Indicates whether the firm uses trade credit.	X	X	X	X	X	X
CHECKING	Indicates whether the firm had any checking accounts.	X	X	X	X	X	X
SAVING	Indicates whether the firm had any savings accounts (includes savings accounts, money market accounts, share accounts, CDs, or other time deposits; excludes retirement accounts, pension funds, and trusts).	X	X	X	X	X	X
LOAN2	Indicates whether the firm has loans other than the most recent loan.	X	X		X		X
LOAN	Indicates whether the firm had at least one line of credit, equipment, motor vehicle, capital lease, mortgage, or other loans.			X			
EDENALL	Indicates whether the firm was denied credit anytime over the past three years. Defined over all firms.	X		X		X	

Table 3 (Continued)

Variables	Definitions	Analysis					
Most Recent Loan Characteristics		(1)	(2)	(3)	(4)	(5)	(6)
MRL_INDX	Interest rate of the index to which the most recent loan was tied. For fixed rate loans it is the market prime rate.	X					
BONDSPRD	Yield on corporate bonds rated BAA – yield on ten year government bonds (at time of loan).	X					
TERMPREM	Yield on a government bond of similar maturity minus the yield on treasury bills.	X					
FIXED	Indicates whether the interest rate on the firm's most recent loan is fixed (vs. variable).	X					
POINTS	Number of points paid to close (extreme observations set to the 99th percentile).	X					
FEE_AMT	Fees paid to close divided by amount borrowed (extreme observations set to the 99th percentile).	X					
LNAMTBRR	Natural log of the dollar amount borrowed.	X					
INVMAT	Inverse of the maturity of the loan (in months).	X					
PCOL (BCOL)	Indicates whether the firm provided personal (or business) collateral on its most recent loan.	X					
GUAR	Indicates whether the firm was required to have a guarantor.	X					
J5_ASST	The size of the loan request relative to firm assets.						X
LOC (MV, LEASE, MRTG, OTH)	Indicates whether the most recent loan was for line of credit (motor vehicle, lease, mortgage, other loan- but excluding loans from owners; loans for equipment excluded).						X
USE_MRL	Indicates whether the most recent loan was intended for short-term financing.						X
MRL_PRIM	Indicates whether the firm's most recent loan application was to its primary institution.	X					X
MRL_9394	Indicates whether the firm's most recent loan application was requested in 1993 or 1994.	X					X
Additional Controls							
IND_1 – IND_9	Industry controls, based on groupings of two digit SIC codes. IND_1 (SIC 10-19), IND_2 (SIC 20-29), IND_3 (SIC 30-39), IND_4 (SIC 40-49), IND_5 (SIC 50-51), IND_6 (SIC 52-59), IND_7 (SIC 60-69), IND_8 (SIC 70-79), and IND_9 (SIC 80-89). IND_2 is excluded from the analysis.	X	X	X	X	X	X
REGION1 – REGION9	Census region controls. REGION1 (East North Central – excluded from analysis), REGION2 (East South Central), REGION3 (Middle Atlantic), REGION4 (Mountain), REGION5 (New England), REGION6 (Pacific), REGION7 (South Atlantic), REGION8 (West North Central), and REGION9 (West South Central)	X	X	X	X	X	X

[a] Columns 1-6 contain all the variables included in our LOCRate, EverDen, FearDen, CrdNeeds, Apply, and DenMRL models, respectively. All models are estimated controlling for the weighting and stratification employed in collecting the NSSBF data.

Table 4

Dependent Variable: LOCRate: Interest Rate on Most Recent LOC
Least Squares coefficients, (t-statistics in parentheses)

	Model 1	Model 2	Model 3	Model 4
Majority Ownership				
AFAM	-0.213	-0.316	-0.354	-0.656
	(-0.591)	(-0.848)	(-0.955)	(-1.060)
HISPANIC	-0.048	-0.065	-0.055	-2.124**
	(-0.139)	(-0.187)	(-0.157)	(-2.156)
ASIAN	0.606	0.483	0.461	0.605
	(1.570)	(1.265)	(1.237)	(0.605)
FEMALE	0.078	0.068	0.032	0.330
	(0.382)	(0.335)	(0.160)	(0.637)
Market Structure				
HHI	-0.908	-0.877	-0.798	-0.995
	(-1.044)	(-0.999)	(-0.925)	(-1.238)
AFAM*HHI				1.602
				(0.550)
HISP*HHI				12.396**
				(2.211)
ASN*HHI				-1.017
				(-0.253)
FML*HHI				-1.433
				(-0.589)
Credit History and Credit Score				
BANKRUPT		1.138*	1.227*	1.205*
		(1.744)	(1.975)	(1.935)
JUDGMENT		-0.540	-0.530	-0.495
		(-1.054)	(-1.074)	(-0.983)
PDELINQ1		0.251	0.118	0.130
		(0.462)	(0.218)	(0.236)
PDELINQ2		0.821**	0.843**	0.916**
		(2.428)	(2.338)	(2.497)
PDELINQ3		0.315	0.337	0.355
		(0.907)	(0.981)	(1.050)
BDELINQ1		-0.063	-0.165	-0.199
		(-0.123)	(-0.324)	(-0.391)
BDELINQ2		0.225	0.033	0.052
		(0.696)	(0.100)	(0.160)
BDELINQ3		-0.184	-0.383	-0.428**
		(-0.892)	(-1.842)	(-2.055)
CREDSCR			-0.007***	-0.007***
			(-2.97)	(-2.918)
Other Characteristics				
MRL_INDX	0.710***	0.724***	0.726***	0.724***
	(6.657)	(7.019)	(7.208)	(7.161)
LNAMTBRR	-0.225***	-0.224***	-0.221**	-0.220**
	(-2.503)	(-2.459)	(-2.414)	(-2.418)
FIN_JBNK	2.411**	2.498***	2.549***	2.532***
	(2.426)	(2.723)	(2.825)	(2.830)
LIABASST	0.305***	0.330***	0.3408***	0.335***
	(3.928)	(4.011)	(4.182)	(4.039)
ASSETS	-0.006	0.004	0.007	0.004
	(-0.059)	(0.039)	(0.064)	(0.035)
Number of obs	1001	1001	1001	1001
F-statistic	9.63***	8.88***	8.90***	8.77***
Adjusted R^2	0.29	0.30	0.31	0.31

See Table 3, Analysis 1, for the full specification of the models.
*, **, *** signifies significance at the 10, 5, and 1 percent levels respectively.

Table 5

Dependent Variable: EverDen: Firm denied credit anytime over the past three years.
Logit coefficients, (t-statistics in parentheses)

	Model 1	Model 2	Model 3	Model 4
Majority Ownership				
AFAM	1.481***	1.151***	1.084***	-0.315
	(6.055)	(4.476)	(4.131)	(-0.454)
HISPANIC	0.412	0.368	0.351	-0.012
	(1.190)	(1.055)	(1.012)	(-0.019)
ASIAN	0.603*	0.579	0.575	1.577
	(1.775)	(1.535)	(1.424)	(1.454)
FEMALE	0.024	-0.055	-0.064	-1.389***
	(0.117)	(-0.253)	(-0.293)	(-2.865)
Market Structure				
HHI	-0.362	-0.636	-0.537	-2.144*
	(-0.309)	(-0.518)	(-0.434)	(-1.722)
AFAM*HHI				8.346**
				(1.973)
HISP*HHI				1.975
				(0.676)
ASN*HHI				-5.549
				(-0.994)
FML*HHI				6.481***
				(3.065)
Credit History and Credit Score				
BANKRUPT		1.149**	1.197**	1.196**
		(2.378)	(2.498)	(2.407)
JUDGMENT		0.673*	0.637*	0.621*
		(1.906)	(1.817)	(1.693)
PDELINQ1		0.555	0.550	0.599
		(0.994)	(0.941)	(0.987)
PDELINQ2		0.499	0.482	0.452
		(0.948)	(0.891)	(0.821)
PDELINQ3		0.988***	0.971***	1.047***
		(3.506)	(3.437)	(3.603)
BDELINQ1		0.423	0.380	0.222
		(0.999)	(0.909)	(0.537)
BDELINQ2		0.899**	0.751**	0.784**
		(2.429)	(1.967)	(2.037)
BDELINQ3		0.589***	0.403*	0.395*
		(2.762)	(1.799)	(1.750)
CREDSCR			-0.009***	-0.009***
			(-3.245)	(-3.261)
Other Characteristics				
ASSETS	-0.212***	-0.196***	-0.189***	-0.189***
	(-3.106)	(-2.747)	(-2.665)	(-2.645)
LNAGE2	-0.373***	-0.363***	-0.339***	-0.340***
	(-3.294)	(-3.065)	(-2.861)	(-2.833)
PRIM_FIN	-1.229***	-1.118**	-1.135**	-1.125**
	(-2.657)	(-2.401)	(-2.408)	(-2.288)
REL_PRIM2	-0.030*	-0.028	-0.026	-0.029*
	(-1.736)	(-1.557)	(-1.481)	(-1.694)
SOURCES	0.122**	0.078	0.075	0.078
	(2.540)	(1.560)	(1.513)	(1.556)
Number of obs	1985	1985	1985	1985
F-statistic	3.68***	3.83***	3.86***	3.75***

See Table 3, Analysis 2 for the full specification of the models.

*, **, *** signifies significance at the 10, 5, and 1 percent levels respectively.

Table 6

Credit Needs and Application Avoidance by Demographic Group

	All	White		Black		Hispanic		Asian	
		Males	Females	Males	Females	Males	Females	Males	Females
Percent of Firms that Desired Credit	48.8	48.8	44.5	69.9*	78.9*	60.2*	55.7	41.9	33.3*
Percent that Desired Credit that Feared Denial	49.9	45.7	50.4	84.1*	86.3*	63.6*	86.5*	61.1*	80.4*
Reasons for Fear of Denial									
Poor credit histories or finances	58.8	58.3	69.6*	50.5	55.7	53.7	35.0	56.4	51.7
Prejudice	4.6	3.1	5.2	19.8*	13.4*	4.9	4.9	1.1	3.8
Other reasons	44.1	43.3	41.4	42.3	46.0	52.1	63.4	48.9	51.4

NOTES:

1. A firm expressed a need for credit if it applied for a loan within the last three years or if it did not apply for a loan within the last three years because it feared that the application would be turned down.
2. Percentages are weighted to reflect population averages. Columns will not add up to 100 since firms were allowed to give up to three reasons for fearing denial.
3. An "*" signifies that the statistic is significantly different from the white-male-owned subpopulation at the 95 percent level of confidence. Standard errors for these tests are calculated using 1,000 bootstrap sample and weight replicates.

Table 7

Dependent Variable: FearDen: Firm did not apply, fearing denial

Logit coefficients, (t-statistics in parentheses)

	Model 1	Model 2	Model 3	Model 4
Majority Ownership				
AFAM	1.491***	1.247***	1.160***	0.663
	(6.305)	(5.012)	(4.701)	(1.298)
HISPANIC	0.737***	0.714**	0.715**	1.086*
	(2.652)	(2.469)	(2.413)	(1.916)
ASIAN	0.401	0.464	0.477	0.595
	(1.424)	(1.435)	(1.388)	(0.774)
FEMALE	0.061	0.001	-0.022	-0.599
	(0.350)	(0.005)	(-0.114)	(-1.542)
Market Structure				
HHI	0.552	0.503	0.600	-0.200
	(0.714)	(0.589)	(0.692)	(-0.196)
AFAM*HHI				2.816
				(1.034)
HISP*HHI				-1.886
				(-0.715)
ASN*HHI				-0.565
				(-0.145)
FML*HHI				2.757*
				(1.780)
Credit History and Credit Score				
BANKRUPT		0.903**	0.907***	0.888**
		(2.515)	(2.602)	(2.555)
JUDGMENT		0.764**	0.720**	0.710**
		(2.334)	(2.219)	(2.163)
PDELINQ1		0.748*	0.687*	0.708*
		(1.759)	(1.714)	(1.771)
PDELINQ2		-0.018	-0.028	-0.043
		(-0.043)	(-0.063)	(-0.100)
PDELINQ3		0.918***	0.919***	0.920***
		(3.420)	(3.446)	(3.439)
BDELINQ1		0.321	0.253	0.217
		(0.950)	(0.768)	(0.662)
BDELINQ2		1.826***	1.694***	1.693***
		(5.215)	(4.683)	(4.720)
BDELINQ3		1.115***	0.915***	0.916***
		(5.782)	(4.707)	(4.688)
CREDSCR			-0.010***	-0.010***
			(-3.789)	(-3.807)
Other Characteristics				
ASSETS	-0.338***	-0.355***	-0.349***	-0.351***
	(-5.282)	(-5.195)	(-5.143)	(-5.133)
LNAGE	-0.093	-0.107	-0.083	-0.078
	(-0.799)	(-0.871)	(-0.671)	(-0.628)
SALEASST	-0.014**	-0.011**	-0.009	-0.010*
	(-2.385)	(-1.975)	(-1.602)	(-1.687)
REL_PRIM	-0.026**	-0.020	-0.018	-0.019
	(-2.139)	(-1.614)	(-1.479)	(-1.529)
SOURCES	0.144***	0.114**	0.114**	0.114**
	(3.289)	(2.400)	(2.385)	(2.406)
Number of obs	2609	2609	2609	2609
F-statistic	7.15***	6.96***	7.05***	6.71***

See Table 3, Analysis 3 for the full specification of the models.

*, **, *** signifies significance at the 10, 5, and 1 percent levels respectively.

Table 8

Dependent Variable: CrdNeeds: Whether firms faced credit constraints anytime over the past three years. Logit coefficients, (t-statistics in parentheses)

	Model 1	Model 2	Model 3	Model 4
Majority Ownership				
AFAM	1.440***	1.165***	1.106***	-0.095
	(6.097)	(4.793)	(4.484)	(-0.154)
HISPANIC	0.659**	0.630**	0.623**	0.347
	(2.354)	(2.304)	(2.328)	(0.730)
ASIAN	0.737***	0.780***	0.783**	1.667**
	(2.620)	(2.599)	(2.496)	(2.535)
FEMALE	-0.033	-0.089	-0.104	-1.479***
	(-0.192)	(-0.485)	(-0.562)	(-3.235)
Market Structure				
HHI	0.082	0.164	0.231	-1.650
	(0.086)	(0.167)	(0.232)	(-1.481)
AFAM*HHI				7.186*
				(1.924)
HISP*HHI				1.501
				(0.623)
ASN*HHI				-4.976
				(-1.560)
FML*HHI				6.847***
				(3.084)
Credit History and Credit Score				
BANKRUPT		1.308***	1.324***	1.313***
		(3.584)	(3.666)	(3.484)
JUDGMENT		0.946***	0.901***	0.905***
		(3.260)	(3.101)	(3.014)
PDELINQ1		0.677	0.620	0.670
		(1.401)	(1.239)	(1.293)
PDELINQ2		0.576	0.527	0.462
		(1.111)	(1.011)	(0.883)
PDELINQ3		1.106***	1.085***	1.126***
		(4.293)	(4.170)	(4.215)
BDELINQ1		0.366	0.314	0.200
		(1.028)	(0.891)	(0.570)
BDELINQ2		0.851**	0.743**	0.753**
		(2.514)	(2.136)	(2.136)
BDELINQ3		0.585***	0.425**	0.425**
		(3.136)	(2.187)	(2.145)
CREDSCR			-0.008***	-0.008***
			(-3.133)	(-3.173)
Other Characteristics				
ASSETS	-0.290***	-0.288***	-0.282***	-0.283***
	(-5.494)	(-5.300)	(-5.174)	(-5.165)
LNAGE2	0.161*	0.165*	0.188**	0.188**
	(1.769)	(1.784)	(2.000)	(2.010)
PRIM_FIN	-0.701	-0.650	-0.636	-0.622
	(-1.535)	(-1.419)	(-1.382)	(-1.352)
REL_PRIM2	-0.192***	-0.183***	-0.180***	-0.182***
	(-7.672)	(-7.196)	(-7.054)	(-7.207)
SOURCES	0.021	-0.014	-0.015	-0.014
	(0.449)	(-0.304)	(-0.315)	(-0.296)
Number of obs	2609	2609	2609	2609
F-statistic	6.97***	6.94***	6.97***	6.71***

See Table 3, Analysis 4, for the full specification of the models.
*, **, *** signifies significance at the 10, 5, and 1 percent levels respectively.

Table 9

Joint Estimate of Application (Apply) and Denial (DenMRL) Equations
Estimates are from a bivariate probit, (z-scores in parentheses)

	Model 3		Model 4	
	APPLY	DENMRL	APPLY	DENMRL
Majority Ownership				
AFAM	0.038	0.368**	0.282**	-0.098
	(0.547)	(2.410)	(2.022)	(-0.317)
HISPANIC	0.053	-0.117	-0.012	-0.159
	(0.566)	(-0.528)	(-0.088)	(-0.459)
ASIAN	-0.272***	0.252	-0.283**	1.562***
	(-3.089)	(1.069)	(-2.100)	(2.615)
FEMALE	-0.056	0.085	-0.056	-0.684***
	(-1.008)	(0.627)	(-0.537)	(-2.722)
Market Structure				
HHI	-0.155	0.376	-0.148	-0.537
	(-0.701)	(0.582)	(-0.597)	(-0.782)
AFAM*HHI			-1.418**	2.490
			(-2.036)	(1.513)
HISP*HHI			0.335	0.355
			(0.563)	(0.227)
ASN*HHI			0.057	-7.009**
			(0.093)	(-2.157)
FML*HHI			0.005	3.730***
			(0.012)	(3.595)
Credit History and Credit Score				
BANKRUPT	0.037	0.846***	0.038	0.786***
	(0.262)	(3.011)	(0.271)	(3.049)
JUDGMENT	-0.122	0.284	-0.120	0.296
	(-1.206)	(1.397)	(-1.193)	(1.533)
PDELINQ1	-0.300**	-0.165	-0.304**	-0.055
	(-2.119)	(-0.590)	(-2.139)	(-0.204)
PDELINQ2	-0.010	0.290	-0.010	0.252
	(-0.072)	(1.094)	(-0.078)	(1.039)
PDELINQ3	0.051	0.468***	0.036	0.443**
	(0.602)	(2.606)	(0.425)	(2.535)
BDELINQ1	0.058	0.611**	0.056	0.452*
	(0.516)	(2.205)	(0.506)	(1.787)
BDELINQ2	-0.030	0.369	-0.030	0.360
	(-0.274)	(1.555)	(-0.275)	(1.628)
BDELINQ3	0.179**	0.390***	0.176**	0.316**
	(2.535)	(2.684)	(2.503)	(2.250)
CREDSCR	-0.001	-0.005**	-0.000	-0.004**
	(-0.634)	(-2.366)	(-0.607)	(-2.215)

See Table 3, Analyses 5 & 6 for the full specification of the models.
*, **, *** signifies significance at the 10, 5, and 1 percent levels respectively.

Comments on "Small Business Lending in Rural America—Findings from the CRA database" by Robert Berney and Charles Ou

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Thank you for inviting me to provide comments on the Small Business Administration's efforts to better understand the small business lending practices of very big banks and bank holding companies in rural areas. My remarks here, of course, reflect my own opinions and not necessarily those of the Department of Agriculture. Before I address the SBA's current efforts, I provide general background information about rural areas, rural financial markets, and the financial concerns of rural small businesses. Much of the information I provide here comes from a study ERS undertook for Congress which was published by the Department of Agriculture as Agricultural Economic Report No. 749, Credit in Rural America, in 1997 and other ERS products.

Rural areas are politically important. Rural States are disproportionately represented in the Senate on a per capita basis, and rural seats in the House of Representatives may determine the majority party in upcoming elections this fall. For example, in each of the last three years Congress has passed multi-billion dollar "emergency" appropriations for farmers reversing the course it set in landmark legislation in 1996. In addition, rural interests and concerns have been important factors in recent legislation modernizing the banking industry (Graham-Leach-Bliley) and in granting China permanent trade status.

Rural areas comprise substantial parts of the U.S. economy and population. Rural residents earn about 15 percent of the nation's personal income or about one-third less per capita than nonrural residents. In

round numbers, rural areas encompass 20 percent of the nation's population and 80 percent of its landmass.

Rural economies face specific issues because of their "ruralness." Their isolation and low population density means that transportation, information, and utility infrastructures are more costly to develop. Their small market size means that they are less likely to support competitive local markets offering a wide range of goods and services. In addition, individual rural markets are characterized by less diversified, more cyclical local economies which can create risk management issues for small, geographically undiversified local lenders.

Rural areas are diverse. The Economic Research Service of the U.S. Department of Agriculture has several ways of classifying the 2,276 nonmetropolitan counties: by economic type, by policy type, and by degree of ruralness along a rural-urban continuum (often known as Beale codes). The resource bases, economic vigor, and sociological and demographic characteristics of counties vary widely. Rarely do general statistics reasonably reflect this diversity. This diversity is important to consider when contemplating public policies. While rural residents are, on average, poorer than nonrural residents, many are quite affluent. And, many rural areas are growing rapidly in both economic affluence and population. Targeting Federal programs to rural areas without respect to other consideration may inadvertently have the affect of disproportionately benefiting well-off rural residents and areas. The ERS county typologies and Beale codes provide a way to subset rural areas that may be of greatest interest for particular policy purposes.

Information about the performance of rural financial markets is generally encouraging, although good reasons exist for concern in areas with particular characteristics. Credit in Rural America concluded after examining available data on agricultural, housing, small business, and community development loans that rural financial markets work reasonably well in serving these sectors of the rural economy. While rural

small businesses are more likely to rely on bank financing than their urban counterparts, they also rate the performance of their financial institutions more highly. While financial market problems exist in some rural communities, and not all segments of the rural economy are equally well served, financial market failures are neither endemic to nor epidemic in rural America. Areas of greatest concern include those counties served by two or fewer banks, areas of persistent poverty, transfer-payment dependency, and persistent out-migration. Such counties are generally sparsely populated or poor.

Turning now to the work by Berney and Ou of SBA's Office of Advocacy, I would like first to praise their willingness to explore ways to use this important new source of geographic data on the small business and farm lending activities of larger banking firms. While much work remains to be done to reach the goal of helping small businesses identify "small business friendly banks," the authors have performed a service by starting to explore this important database and documenting some problems that arise, particularly in comparing data over time.

I'd like to note some additional cautions in reading and interpreting their statistics. First, the definition of statistics presented is easily misunderstood or confused. For example, one must be careful to remember that the rural share of small business loans or rural share of deposits as in tables 1-3 refer to the rural share of business loans or deposits of a particular bank holding company's totals. In tables 4-8, the rural small business loan share statistics refer to the total rural share of total lending within each state by the 38 bank holding companies covered by the report. These statistics do not refer to the share of rural small business lending or deposits of these bank holding companies compared to any other banks or lenders in rural areas. Thus, these statistics alone cannot be used to compare large bank holding company performance to that of other lenders.

A second caution regards the ratios of shares and their interpretation. Ratios of shares such as the ratio of rural small business loans to rural deposits in the last column of table 1 cannot be used to indicate

anything about deposit or capital flows into or out of rural areas. This is true because small business loans are a much smaller part of portfolios of most banks than are deposits. Without more information, no conclusions about capital flows can be reached.

Interpreting this ratio (rural share of small business loans to rural share of deposits) may be problematic. Berney and Ou interpret a ratio of one as a sort of "breakeven" point that indicates small rural businesses are being treated "fairly" in some sense. When this ratio equals one, it literally tells us that a dollar deposited in a rural office has an equally likely chance of being lent to a rural small business as a dollar deposited in an urban office has being lent to an urban small business. Note the lending does not have to be in the same service area as the deposit for this to be true. In addition, I am concerned with the interpretation of "fairness" related to this measure for two reasons. First, most large banks have multiple sources of funds including nondeposit sources and the measure ignores from whence these funds ultimately originate and to where they are distributed. Of course, there is no data for nondeposit funds comparable to the CRA data used here, so perhaps the best we can do is acknowledge that nondeposit funds complicate the story. Second, loan demand is not geographically tied to deposit supply. Throughout our country's history, capital has flowed between geographic areas. This is an important function of the banking system and often a necessity of development. Rural areas and residents have repeatedly been beneficiaries of this flow both as borrowers and as savers. I would prefer a measure of fairness that revealed more about the level of economically viable loan demand to local wealth.

Similar observations apply to the ratio of the percent of rural small business loans to the percent of rural small businesses (table 7 and 8). Third, interpreting a value of one as "fair" for this ratio ignores the documented smaller size of rural small businesses compared to nonrural small business.

In closing, I would like to make one suggestion in particular, related to my opening comments. Rural areas are diverse and, I think, from a public policy perspective we have most reason to be concerned

about rural financial market performance in smaller, poorer, and more isolated rural areas. Combining performance measures across all rural areas will not tell us how these areas of greatest public policy concern may be fairing. Even if large banks appear to be serving rural small businesses well in general, those in the most vulnerable areas may not be. Therefore, I suggest that SBA consider using the Economic Research Service's county typology, Beale codes, and data on highly concentrated rural banking markets to compile statistics on these areas in addition to those for rural areas as a whole.

Finally, let me reiterate that Berney and Ou have made a good start at finding a policy relevant use for this unique and important data. Thank you for inviting me to comment on your work, I look forward to seeing more of it.

The Impact of Bank Consolidation on Small Firm Financing

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June, 2000

Abstract

A major concern of policymakers regarding bank market deregulation is that the consolidation of the banking industry might lead to a reduction in credit availability and/or an increase in the cost of credit to some parts of the business and consumer community. This study examines the experience of 3,600 small firms in their most recent attempt to locate financing for their businesses. About 25 percent of the firms experienced a merger or acquisition of their primary bank. The impact of that merger on access to credit and the various components of loan terms were examined for applicants at commercial banks. Merger activity had no meaningful impact on the ability to obtain a loan or the contract loan rate on the most recent loan. However, mergers appear to increase non-price loan terms, increase the incidence of related fees for services, raise the frequency of loan search activity, and result in deterioration of service quality.

JEL Classification Codes: G21

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We thank Ken Kopecky, Paolo Sapienza, Morris Danielson, and participants of the Federal Reserve System Research Conference on Business Access to Capital and Credit (March, 1999) and AEA (January, 2000) meeting session participants for their helpful comments on an earlier draft.

The Impact of Bank Consolidation on Small Firm Financing

1. Introduction

Since 1990, the number of insured commercial banks has fallen by over 3,000 as a result of merger, acquisition or failure[1]. The causes of this consolidation have been well-documented (e.g.,Berger, Demsetz, and Strahan, 1998) and a substantial literature examining the consequences for small firms has evolved as well. Of particular concern to regulators is the effect of consolidation on small firm access to capital and the cost of that capital. Small firms play an important role as the engine of innovation and job growth in the economy and are heavily dependent on bank financing for external capital (Cole et. al.,1996, Berger and Udell, 1998, Dennis, Dunkelberg and Van Hulle, 1988). Thus, any reduction in the availability of credit as a result of banking consolidation could have important macroeconomic implications.

Several approaches have been taken in the literature to determine the potential impact of consolidation on small business access to credit, but all involve an examination of the impact of mergers on the structure of bank balance sheets and in particular, the fraction of assets held as small-sized loans. One group of studies (e.g., Berger et al, 1995, Berger and Udell, 1996, Keeton, 1995, Peek and Rosengren, 1996 and Strahan and Weston, 1996) found that large banks hold a proportionally smaller share of their portfolios in small loans ($1 million or less) than small banking organizations. More recent studies (e.g., Peek and Rosengren, 1988, Strahan and Weston, 1988) examine the pre- and post-merger asset allocation to small loans and find that mergers between two small banking institutions appear to increase the share of assets held as small loans, but find no clear, predictable outcome when two large banks or a large and a small bank merge. Perhaps the most comprehensive evidence is provided by Berger et al (1998), who conclude that the competitive response of other banks in the local market offset most, if not all, of the impact of the merged bank's portfolio reduction in small sized loans.

[1] "Changes in Number of Commercial Banks" (online) Available: http://www2.fdic.gov/hsob/

Unlike previous research that relies on bank balance sheet data to examine the impact of mergers on credit availability to small firms, this paper uses firm level data from the 1995 Credit Banks and Small Business survey of small borrowers conducted by the National Federation of Independent Business. In the 1995 survey, the fifth since 1980, a new question was added to address bank consolidation: "During the last 3 years, was your principal financial institution bought out or absorbed by another?". Overall, 25% of the respondents reported a merger or acquisition of their primary bank within the past three years. The data set permits an assessment of how consolidation has affected the quantity of credit available, the cost of credit (both price and non-price terms) as well as the quality of service delivery while controlling for firm, bank and market size characteristics.

Three conclusions emerge from this analysis. First, consolidation had no impact on the ability of firms to obtain the credit they desired, but it did increase the search cost of obtaining credit as firms reporting a merger of their primary bank more frequently reported shopping for a new bank and approached more banks for their most recent loan application. Second, consolidation had no significant effect on reported interest rates on the most recent loan, but other non-price terms (e.g., collateral requirements, compensating balances, fees) were more onerous. And third, consolidation had an adverse impact on several dimensions of service delivered in the banking relationship, including the accessibility of the account manager, services offered, capability of staff, continuity of account manager, and lending criteria). Younger firms, our proxy for those that would be most informationally opaque, do not bear a higher "cost" of merger activity compared to larger, older, less informationally opaque firms.

2. Bank Consolidation and Small Firm Access to Credit

The most frequently cited theoretical basis for expecting changes in small business lending activity as a result of mergers is the organizational architecture at large banks (which increase in number and market share due to mergers) and the diseconomies in the cost of collecting information that may be a function of bank size. Large institutions have higher coordination costs that generally result in more standardized credit policies to ensure that remote lending decisions are consistent with the firm's overall goals. Such standardization

works well for informationally transparent borrowers where the transparency arises through external market measures of firm quality. It also works well for those firms with specific risk characteristics that are easily captured through standardized measures of credit quality such as credit scoring models.

The costs of screening and monitoring smaller firms that are more informationally opaque may create diseconomies within larger financial institutions. These diseconomies arise when the required information for credit extension falls outside the standard parameters necessary to achieve decreasing unit costs from investments in information technology used in the underwriting process. Thus, larger banks with different investment strategies and more complex management structures will find small firm lending too costly to undertake with their standard ratio-driven approach to lending (see Cole, et. al., 1999). If this action produces reductions in credit supply or higher lending charges to small firms, they may become increasingly dependent on smaller, more entrepreneurial lenders.

Static analyses of the relationship between bank size and small firm lending has generally shown that the proportion of small loans in a bank portfolio declines with bank size (Berger, 1996, Keeton, 1995, Peek and Rosengren, 1996, Strahan and Weston, 1996). However, the association between organizational complexity and small firm lending in both static and dynamic analyses has provided less conclusive results (Berger, et. al., 1998, DeYoung, Goldberg, and White, 1999 and Keeton, 1995).[2] Dynamic analyses that investigated the association between a commitment to small firm lending before and after mergers have produced mixed results as well. For example, Peek and Rosengren (1998) find

[2] It is not surprising that the evidence on organizational structure and its impact on small firm lending is mixed because a strategy for mid-market lending can be executed through many different organizational forms. A review of many of the largest banking organization annual reports over the past few years reveals a consistent commitment to mid-market lending as a critical part of their business strategy While the motivations for a focus on the mid-market may vary, most observers of the banking market concur that increasing competition in wholesale capital market activities is driving down profit margins and that the mid-market (usually defined as $10 - $50 million in sales) is one of the few alternative sources of potential economic profit for bank lending. It does appear that new technologies, better information and a more diverse capital market driven by financial innovation (such as securitization) better explain developments in small firm lending markets than just bank scale and organizational complexity.

that acquirers recast the target bank's lending portfolio into their own image, and, because most acquisitions involve two or more small banks, they suggest the concern over acquisitions and lending to small firms may be overblown. However, in their sample, half of the mergers resulted in post-merger declines in small firm lending (as measured by the percentage of assets held in the form of "small" loans).

Strahan and Weston (1998) examine the dynamics of acquisitions and small firm lending at the bank holding company level. They find that small business lending increases up to $300 million in holding company size and decreases thereafter. Like Peek and Rosengren, they find that consolidation of small banking firms results in increased bank lending to small firms. Berger et al (1998) have conducted the most comprehensive study at the market level and therefore are able to capture the effect of competitors on total market share of small firm lending. They found that other banks in the market offset the negative effects of consolidation on small firm lending, a finding confirmed by our own work.[3] Thus, in most markets, there are sufficient competitors to guarantee no sustained reduction in credit availability as banks restructure themselves to take advantage of new technologies and changing markets. The authors do note that: "our data set does not contain borrower characteristics other than our measure of the size of their credit. It is possible that consolidating banking institutions change their mixes of borrowers in ways not detected here. For example, consolidating institutions may substitute transactions-based loans to relatively informationally transparent small businesses for relationship-based loans to relatively informationally opaque small borrowers" (Berger et al , 1998, p. 226).

3. Hypotheses and Model Specification

To understand how banking consolidation could affect small firm access to credit and loan pricing, we begin with a simple, bank-centered model of risk-adjusted return on capital. Economic profit can be defined as the total income associated with a loan less three costs: 1)

[3] This result was consistent with Goldberg and White's (1998) finding that de novo banks lend proportionally more to small firms than existing banks of comparable size.

allocated operating expenses; 2) expected losses; and 3) a capital charge. Mathematically, this model can be represented as:

(1) Economic Profit = Income – Operating expense – Expected loss – capital charge, where

Income = interest income + fees

Operating expense = cost of producing the loan including funding cost and all allocated overhead expense

Expected loss = default probability x unrecoverable principal

Capital charge = cost of capital x the capital allocated to the loan where the capital allocated is based on unexpected losses.

In a competitive market with homogeneous products, lenders would just earn their capital charge across all products producing an economic profit of 0. If the bank has some competitive advantage in the provision of banking services (due to market power or differentiated, non-replicable banking services), then excess profit would be greater than 0. The goal of lending officers is, then, to maximize the economic profit associated with each loan.

A lender has a several margins where adjustments can be made in equation (1) to maximize the outcome. This adjustment can best be seen by rearranging equation (1) to focus on factors under the lending officer's direct control:

(2) Economic Profit+ Operating expense + capital charge = Income – expected loss

The left-hand side of equation (2), which any individual operating unit or lender would take as given, represents a "gross return" requirement. The lender can meet or exceed this target by increasing income or reducing the expected loss associated with each loan. Raising the nominal loan rate and/or fees can increase income. The expected loss can be reduced by lending to less risky customers, by reducing contingent exposure or by taking collateral, requiring compensating balances or taking other steps to reduce the severity of

a loss. The assessment of the potential severity of loss is also a function of the cumulative knowledge (both formal and informal) that the bank has about the borrower, with less knowledge, all else equal, leading to more conservative estimates. The decision to accept or reject a loan application, then, is based on an assessment of the incremental income versus expected loss. It is also possible that 'Operating Expense' becomes a margin for adjustment at the firm level if the acquiring bank's loan approval technology is driven more by credit scoring models or if the service offerings become more standardized to achieve economies of scale in operation. In this case, less emphasis would be placed on costly information acquired through banking relationships or fewer customized services, resulting in less credit, or more expensive credit, or fewer customized services to more informationally opaque borrowers.

The presence of these margins (i.e., rate, collateral, fees, rationing, service quality) and the potential trade-offs between them means that the impact of such events as a merger of the firm's primary bank is difficult to estimate, as the impact of any event can be spread over all available margins. The "importance" (and "significance") of the change on any given margin is potentially diluted by the adjustments that occur on other margins. And, in a competitive market, the lender's total adjustments on all margins are constrained to earn the minimum economic profit. Indeed, "substitute" adjustments on these margins are part of the negotiating process between the lender and the borrower. In markets with reduced levels of lender competition (due to fewer banks in a smaller market or the presence of larger banks that have significant economies of scope and scale), the gross return in (2) will likely be larger than in more competitive lending markets.

From an empirical perspective, a number of equations (using each margin as a dependent variable) must be used to identify the importance of a particular event or condition on credit terms and availability, such as consolidation. Ideally, we would want to "sum" the effects over all possible margins to understand the cumulative effect of consolidation on small firms. However, computation of a cumulative effect is a difficult empirical task and is not attempted in this paper. The cross-adjustments that may be present are considered in the

empirical estimation process by including "substitute" margins in the analyses where possible. Our ultimate conclusions about the impact of mergers on small businesses will be based simply on observing the frequency of negative effects (poorer credit access, more onerous loan terms, deteriorating service delivery) across the various margins for adjustment.[4]

4. Data and Variable Construction

The data in this study come from the 1995 Credit, Banks and Small Business Survey conducted by the National Federation of Independent Business ("NFIB").[5] This survey was the fifth in a series that extends back to 1980. Eighteen thousand surveys were mailed to a sample of the 600,000 membership of the NFIB. After two mailings, 3,642 completed surveys were available.[6] The question of interest to this study is: *"During the last 3 years, was your principal financial institution bought out or absorbed by another?"* One-fourth of the firms report that their principal financial institution had been bought (or absorbed) in the three years prior to the survey. Of these, about half report that the change had not been positive, including 14% that changed banks as a result

[4] We are unable, however, to make any general equilibrium assessments about consolidation. For example, consolidation could represent the creation of market power by reducing the number of competitors and creating barriers to entry. In this case the acquiring bank would attempt to expand market share and raise prices to maximize economic profit. It is also possible that due to this market power, some current customers would be denied credit if the bank believed that the additional income did not offset the expected loss. Alternatively, consolidation could be the result of the elimination of excess capacity in the banking system. In this case, prices and quantities would be adjusted so that the remaining participants could earn a normal rate of return on their invested capital. Unfortunately, the results of both outcomes could be higher rates and reduced access to credit, making it extremely difficult to interpret the result as "good" or "bad" from an overall market perspective.

[5] The representativeness of the NFIB membership of the small business sector has been documented in William C. Dunkelberg and J.A. Scott, 1983, *Report on the Representativeness of the National Federation of Independent Business Sample of Small Firms in the United States*, mimeo, Small Business Administration grant #SBA2A-0084-01, Purdue University, West Lafayette, IN. Also, a comparison of the distribution of the 1993 National Survey of Small Business Finance to the 1995 Credit Banks and Small Business Survey show that the NSSBF sample is more heavily weighted towards smaller firms. The NSSBF distribution is more heavily weighted towards partnerships, firms that have been in business 5-9 years, firms with have fewer than 20 FTEs (especially sole proprietors), and the professional services industry.

[6] To improve the response rate, the questionnaire is mailed twice with a two-week interval to the random sample of members selected. Duplicates are eliminated. Information is available about the firm prior to the mailing, making it possible to detect any response bias with respect to employment, sales, industry, region etc. Historically (since 1973) no response bias with respect to these variables has been detected, although there has been a secular decline in the overall response rate. Two mailings generally produce a close approximation to population distributions. See Dunkelberg and Day (1973).

of the merger or acquisition. Only 6% view the change as favorable and 15% were still assessing the overall impact of the merger on their banking relationship at the time of the survey. The responses to the merger question are related to a number of questions related to the respondent's interaction with financial institutions: (1) their success in obtaining their most recent loan; (2) their assessment of whether all of their borrowing needs were met; (3) their decision to shop for another bank for their business; (4) the number of applications (searches) to obtain their most recent loan; (5) various loan contract terms such as the rate charged, collateral assignment, the requirement to do other financial business at the lender; (6) the scope and scale of fees on banking products; and (7) an assessment of the quality of five bank service characteristics (accessibility and continuity of account manager, services offered, capability of staff, and lending criteria). Firm-specific risk factors such as years in business, total employment, sales growth, and market structure (market size, bank size, assessment of competition) are controlled for in the analysis. The definition and summary statistics of the relevant variables used in this study is shown in Table 1. The number of observations in Table 1 differs from 3,642 for some of the variables because 'no answer' or missing responses are excluded from the computation of the mean and standard deviation.

Simple bivariate analyses of the impact of bank consolidation on access to credit and loan pricing are shown in Table 2. These data show no significant difference in the denial rate on the most recent loan for firms that experience a merger and those that did not. However, those firms that experience a bank merger more frequently report a worse experience on the other credit access margins. Although the denial rate may not have been significantly different, it appears that the transactions cost of satisfying credit needs rise with consolidation. The impact of consolidation on loan terms is mixed. Firms experiencing a bank consolidation have a higher incidence of collateral assignment and the requirement to use other financial services at the bank, but do not pay higher rates. The effect of consolidation on fees, both the number and charge per unit of service, is unambiguously positive. The firms that report increases in fees and experience mergers also believe they received less value for the increase than those firms that did not experience mergers. As was the case with fees, the rankings of performance on

five service characteristics by small firms were significantly worse for those firms that had experienced a merger with their primary financial institution. Merger experience also has a strong association with market structure. Firms located in larger markets and those currently doing business with large banks more frequently reported mergers. However, there is no association between merger activity and the firm's assessment of competition for their business.

The t-tests presented in Table 2 are suggestive of a persistent relationship between consolidation and small firm access to and cost of credit. However, these tests do not control for firm risk characteristics (operating and financial) or market structure. If the mergers reported in this survey involved primarily larger banks taking over smaller banks, then we might expect the customers of small banks to be more adversely affected than those of large banks (see Peek and Rosenberg, 1998). If mergers take place in markets with fewer banking alternatives for small firms, then we might expect firms located in smaller markets to be more adversely affected because there is less potential competition for their business. Mergers may also diminish the strength of individual banking relationships independent of bank and market size through account manager turnover, potentially reducing credit availability and making loan terms more onerous (see Cole, 1998, Scott 2000).

Three "margins" serve as dependent variables in the model: credit availability, loan terms and service delivery characteristics. The construction of these variables and the estimation technique used is shown in Table 3. The general form of the model is:

(3) $\text{Margin}_i = \alpha_0 + \alpha_1 \text{Merger} + \alpha_2 \text{Market structure} + \alpha_3 \text{Bank size} + \alpha_4 \text{Strength of bank relationship} + \alpha_5 \text{Firm/owner characteristics} + \alpha_6 \text{Financial risk} + \varepsilon_i$

Several general comments about the dependent variable construction need to be made. First, the sample for each of the dependent variables is limited to those respondents who reported trying for a loan at a commercial bank within the three years of the survey because of the time frame implied in the 'merger' question, which is the critical independent variable. Furthermore,

the limitation to commercial banks eliminates potentially unwanted variation attributable to different dynamics in finance company, credit union or personal lending markets.[7] Second, for several of the credit access variables (e.g., borrowing needs not met, shopped for a new bank, number of loan applications), respondents that were turned down on their last loan request were excluded from the analysis in order to hold credit quality constant and better isolate the effect of mergers on credit worthy customers. Third, the sample for analyzing difference in the probability that an owner shopped for a new bank and number of loan applications made was further limited to those firms that did not report changing institutions as a result of a merger. And fourth, the two fee-related variables (number of fees and unit cost) have been converted to 1/0 variables in order to avoid confusion over interpreting the marginal effects of the independent variables. For example, 'Number of Fees" takes on values from '1 = decreased slightly' to '5 = increased substantially' or ''Knows you and your business' takes on values from '1 = poor' to '5 = good.' It's not clear that a value of 5 should be interpreted as five-fold better than a value of 1, so to resolve this problem, 'Increased substantially' and 'Increased slightly' are assigned a value of '1' for the fee variables and all other responses are '0'.

'Merger' is a 1/0 variable taking on the value of '1' if the firm answered yes to the question, "Was your primary bank merged or absorbed in the past 3 years". 'Market structure' includes three variables: change in competition, market size by population (rural, small city, city, etc.) and region (northeast, south, etc.), while 'Bank size' includes bank asset size (under $100 million in assets, $100 - $1 billion, and over $1 billion). 'Strength of bank relationship' is represented by two survey variables: the length of time with the primary lender and the number of different account managers in the past 3 years. 'Firm/owner characteristics' include (log) full-time equivalent employees, (log) years in business, sales growth over the past three years as a proxy for growth opportunities, form of business and 1-digit SIC codes, gender and ethnicity.

The 'Financial risk' proxies include loan size and maturity and are used in the interest rate, collateral, and other financial services equations. Although a debt to asset ratio would

[7] Over 88% of the loans reported in the Survey were from commercial banks.

have been a useful control variable, total outstanding debt was not known for firms in the study. A set of contract terms (collateral status of the loan and requirement of other financial services as a condition of the loan) is included in the interest rate equation to represent other margins on which a lender can adjust for risk. These variables are included to control for any spurious correlation that could occur through alterations in other loan terms.[8] The interest rate equation also includes variables to account for economy-wide factors that impact the level of interest rates. The average 3 month LIBOR rate during the quarter in which the loan was made is used to control for the level of rates, the spread between the Baa bond yield and the 10 year constant maturity rate is used a proxy for default premiums, and the spread between the constant maturity Treasury yield appropriate to the maturity of the loan and the 3 month secondary market Treasury yield is used to capture the impact of changes in the term structure on loan pricing. All data were obtained from the Federal Reserve Board H.15 series reports. In addition, following Petersen and Rajan (1994), a 1/0 categorical variable for floating rate loans tied to the prime rate is also included as a control variable.

5. Analysis of Results

Tables 4 (credit access), 5 (loan terms), and 6 (service characteristics) include the coefficients for the merger, competition, bank and market size variables only. The full model results can be found in the Appendix A-1, A-2 and A-3. The multivariate results generally confirm the bivariate results shown in Table 2. After controlling for bank and market structure factors, the impact of mergers on the most visible margins to policymakers appears to be benign: mergers have no significant effect on the denial rate, the desired amount of credit, or the contract loan rate.[9]

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[8] The inclusion of these variables attempts to control for the jointly endogenous nature of the loan pricing variables. However, the gains from joint estimation would depend upon identification of unique independent variables for each loan term and/or the existence of serial correlation among the error terms of the five equations. We have no strong theoretical guidance on identifying a unique characteristic for each term. Moreover, using OLS for each equation, correlation coefficients were computed for the residual terms of each equation and they were found not to be significant.

[9] A two-stage Heckman model was also estimated for loan denial equation to address the problem of selection bias because only those firms that applied for credit are examined, excluding those that did not. Identification is a problem in this estimation because the variables that would be strongly associated with applying for a loan also would affect the credit granting decision. If external funding needs are driven by

However, other costs of accessing credit appear to have been increased by merger activity. For example, small firms reporting a merger report a significantly higher incidence of shopping for a new bank or applying at more banks for their most recent loan. The finding that merger activity is significantly related to the chance of shopping for a new bank, but not to satisfaction of credit needs, is not contradictory. Small firms could have been "voting with their feet" in response to deterioration of service delivery or unhappiness with loan terms or prices of bank services as a result of the merger. The estimates in Table 6 clearly show that those small firms that experienced a recent merger report significantly worse performance on each of the five service delivery characteristics.

Mergers also increased the non-rate cost of loans, although a determination of whether the overall effective cost of credit changed cannot be made. Small firms experiencing mergers report a significantly higher probability of collateral assignment, the use of other bank services as a condition of the loan, a higher number of bank fees, and higher costs "per unit" of bank services received. The increased fees and unit fee costs conform with "conventional wisdom" about the impact of mergers and may represent a cost of increasing complexity of organizational architecture, where more standardized transactions costs are imposed to better align revenues and costs at the acquiring bank. The higher probability of collateral and other service requirements may reflect the impact of a 'cookie cutter' approach to underwriting or an effort by the acquiring banks to maintain low nominal rates (highly visible) while enhancing expected revenue on the less visible margins. While we cannot measure the overall impact on the effective cost of credit directly, there is compelling evidence that it increased at least modestly given that 1) mergers increased the cost of four non-rate margins versus a (non-significant) decrease on

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the business opportunities a firm faces, the use of bank services (and the resulting relationships that could be developed), bank and market structure characteristics should not play a significant role in the decision to apply for a loan. Thus, the independent variables used in modeling the application decision include only the Firm/owner characteristic proxies. The results of this approach do not change the conclusions drawn from Table 4.

the rate margin and 2) the quality of service delivery has generally deteriorated with merger events.

A few comments are in order about the control variables for market and bank structure in the availability and term equations and their relationship to some findings in the existing literature. First, in the loan denial equation, firms located in small markets have lower denial rates, a result consistent with Petersen and Rajan's [1994] hypothesis about market competitiveness and credit rationing. They predict that less competitive markets allow banks to lend more to small firms because they can maintain higher rates over time that they could in a more competitive market where the free-rider problem would minimize the incentive to invest in information discovery for "opaque" small firms. Supporting evidence for this hypothesis is found in the interest rate equation where firms in smaller markets (and at smaller banks) pay higher rates. Second, the outcome in the loan term equations of no persistent bank and market size effect supports the idea that dynamic adjustments by other banks in the local market (whether large or small) can offset most of the "quantity loss" of loans devoted to small firms that has been experienced. Competition within the market is important, and after this phenomenon is taken into consideration, the merger event no longer has any impact. Both of these outcomes are consistent with the Berger, et. al. [1999] results.

The regression analysis estimates the "average" impact of the merger event for all firms. It could be the case that the lack of a significant effect of mergers on the denial rate or borrowing needs equations is due to differences in degree of the information opacity inherent in small firms. For example, very small firms that require high costs of producing information about the firm through relationships may well be rationed after a merger if the lending technology of the large bank acquiring the firm's previous bank is more oriented to objective, credit scoring-type credit evaluation. Larger, more established firms, however, may be more amenable to this type of technology and relationships may not be as important for these firms to obtain their desired financing. These firms may benefit from the merger while small firms do not with the resulting effect "washing out" in the

overall estimate. And, for these same "small" small firms, more onerous terms or outright credit rationing may offset the higher cost of producing loans with the new technology.

To control for the degree of information opaqueness, firm age is used instead of firm size to control for "life-style" enterprises that may remain small, but that are well known by their lenders because they have been in business for many years. Newer firms, without a track record, are those that are most information problematic. Two samples at the extreme of the distribution of years in business are created: first, all firms that are in the 10^{th} percentile (5 or less years in business); and, second, all firms that are in the 90^{th} percentile (25 or more years in business). Each of the equations in Tables 4, 5, and 6 are re-estimated for these groups and only the merger coefficient is presented in Panel B. Overall, the results provide little, if any, support for the idea that mergers have more adversely affected "new" small firms than "older" small firms. The one exception occurs in the denial equation where older firms did have a significantly lower turndown rate.

If the impact of mergers is invariant to firm size, it could vary in a "non-linear" way on other factors such as the size of the bank or the size of the market in which the bank and the firm negotiate. To address this possibility the sample was stratified by market size and bank size to identify the impact of mergers on the credit access proxies at the tails of the distributions for each of these important independent variables. Market size is divided into two groups that isolate the "tails" of the sample distributions: "small market" (rural and small city under 20,000) and "large market" (large city and metropolitan over 1 million). Likewise, bank size is partitioned into "small" (under $100 million in assets) and "large" ($1 billion or more in assets) and competitive assessment is divided into "increased "(much more and slightly more) and "decreased" (slightly less and much less). The coefficient on the merger variable only is presented in panel B of Tables 4, 5 and 6 for all of the dependent variables.

Three conclusions can be drawn from the market/bank size stratification results. First, mergers have the greatest effect on large market/large bank availability (i.e., a merger significantly decreases the probability of being denied) and has a bigger negative (favorable)

impact on rates paid by firms located in small markets doing business at small banks. The larger decrease in rates in small markets may be attributable to the increased loan production efficiencies imposed by the acquiring bank, an effort to increase market share, or, perhaps more likely, reflects a more uniform pricing grid that may be driven by the lower rates that it charges in more urban, competitive markets. The lower denial rates in larger markets (or at larger banks) where a merger has occurred may reflect a desire to increase market share in response to the "dynamic" competition from other banks for small firm customers. Second, the transactions costs associated with obtaining the desired amount of credit are greater for firms located in large markets doing business with large banks. This outcome most likely reflects the greater concerns with the quality of service delivery as large banks, which are generally located in larger markets, and that have often struggled to integrate systems in mergers and significantly reduced staff in an effort to meet the earnings projections associated with the merger. Either of these two responses has generally led to poorer service delivery. Third, the impact of mergers on the number of services with fees and the fees per unit of service appears to more concentrated on small firms doing business at small banks, yet there is also appears to be no significant difference in responses by market size. This outcome could be the result of the acquiring bank bringing fees more in line with costs.

6. Summary and Conclusions

The effects of consolidation within the banking industry are difficult to identify and estimate because firms and banks can respond to changing market circumstances on many margins. Banks merge to increase current and future returns and can do so by making adjustments to the amount of lending, nominal prices (interest rates), or effective rates that take non-price terms into consideration, and service delivery with the first two adjustments being the primary concern of policymakers. Depending on the degree of market power, small firms either have to bear the higher cost (when the merging bank increases market power or adopts a more impersonal loan production technology) or adjust with their "feet" by choosing other banks in competitive markets. From a small firm's perspective, the results of consolidation would be "bad" if credit availability was diminished, or search costs increased, or loan terms became more onerous.

The findings present a mixed picture because the impact of merger events on the variables most observable to policy makers, denial rates and loan contract rates, is benign. However, mergers do appear to increase search costs for credit as represented by the decision to shop for a new bank and the number of applications made for the most recent loan. Mergers are also significantly associated with more onerous non-price terms: more collateral, more required services, more fees, and higher fees per unit of service. And, mergers are significantly associated with a reduction in the quality of service delivery characteristics. Whether the total effective cost of credit changed cannot be directly determined from these data, although the fact that four non-price margins became more onerous and service delivery deteriorated suggests that it has.

These results, while statistically and economically robust, must be interpreted with caution in the context of the existing literature. First, the data do not allow us to distinguish between mergers and acquisitions. This difference has been shown to be important in explaining the shares of small loan commitments as a share of assets. Moreover, extant research has confirmed a three-year gestation period to achieve "equilibrium" lending shares in the combined bank's portfolio after a merger. The NFIB survey only asks about consolidation within the past three years and does not specify the date at which the action occurred. Thus, any dynamic effects of consolidation on the margins investigated in this paper cannot be captured. And finally, the relative sizes of the acquiring and acquired bank have been shown to be an important predictor of how the shares of small loans will change after consolidation. Only the size of the current principal banking organization is known, not the prior bank. Nonetheless, the data from this survey provide a complementary perspective to the analyses using the National Survey of Small Business Finance (NSSBF) data and thus help further our understanding of how banking consolidation has affected small firm's ability to raise capital and its price.

Overall, our results complement the existing literature by providing one of the first perspectives on mergers from the small firms' point of view. The effective cost of credit

appears to have increased and service quality has deteriorated when mergers have taken place. Nonetheless, if obtaining credit is the "bottom line" affecting the ability of small firms to expand and create employment opportunities, then our results suggest that bank consolidation has not compromised the ability of small firms to perform their economic function in the economy.

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Table 1
Descriptive Statistics

Survey Variables	Mean	Std. Dev.	Minimum	Maximum	No. of Obs.
Credit Access					
Turned down ('1' if the respondent reported that they did not get a loan the last time that they tried and '0' if they did get the loan)	0.11	0.32	0	1	3,180
Borrowing needs not met ('1' if the respondent answered 'No' to the question "Over the last 3 years, was your firm able to satisfy its borrowing needs at all times and '0' if they reported 'Yes')	0.26	0.44	0	1	2,690
Shopped for new bank ("1" if the respondent answered 'Yes' to the question, "Within the last 3 years, did you actively shop for a different financial institution to service your business needs," and "'0" if they answered 'No.')	0.31	0.46	0	1	3,518
Number of loan applications ("From how many financial instiutions in total did you TRY to get a loan before you were successfulor stopped trying? (EXCLUDE private individuals)"	1.45	1.02	1	9	2,788
Loan Terms					
Interest rate (contract rate paid on the most recent loan)	9.44%	2.12%	1.0%	32.0%	2,388
Collateral ('1' if the respondent answered 'Yes' to the quesiton "Was business and/or personal collateral required?" and '0' if they answered 'No')	0.66	0.48	0	1	2,580
Financial services required ('1' if the respondent answered 'Yes' to the question "Was your business required to conduct other financial activities with the lender, e.g., maintaining a checking account?" and '0' if they answered 'No')	0.28	0.45	0	1	2,567
Number of fees ("Over the last 12 months, have the number of services on which you pay fees:" 1 = Decreased substantially; 2=Decreased slightly; 3 = No change; 4 = Increased slightly; and 5 = Increased substantially)	3.51	0.80	1	5	3,323
Fees per unit ("Over the last 12 months, have the fees per unit of service:" 1 = Decreased substantially; 2=Decreased slightly; 3 = No change; 4 = Increased slightly; and 5 = Increased substantially)	3.59	0.75	1	5	3,177
Quality of Service:					
"Over the last 3 years, have you noticed a change in the following characteristics of the financial institution your firm has dealt with most often?" '3' if the respondent reported 'Better', '2' if 'No Change' and '1' if 'Worse'					
Accessibility of account manager	2.04	0.54	1	3	3,120
Services offered	2.08	0.58	1	3	3,206
Capability of the staff	2.00	0.54	1	3	3,187
Continuity of account manager	1.94	0.54	1	3	3,072
Lending criteria	1.87	0.58	1	3	2,959
Market structure/power					
Population					
Small (under 20,000)	0.23	0.42	0	1	3,642
Mid (between 20,000 and 1 million)	0.23	0.42	0	1	3,642
Large (1 million or more)	0.53	0.50	0	1	3,642
Competition ("Have you noticed any change in competition for your firm's business among financial institutions now compared to 3 years ago? '1 = Much less competition,' '2 = Slightly less competition,' '3 = No change,' '4 = Slightly more competition' and '5 = Much more competition')	3.43	0.85	1	5	3,485
Banking characteristics					
Small (assets under $100 million)	0.21	0.41	0	1	3,642
Medium (assets between $.1 - $1.0 billion)	0.28	0.45	0	1	3,642
Large (assets exceed $1 billion)	0.38	0.48	0	1	3,642
Length of banking relationship ("When was the last time you changed principal financial institutions?" '1' = within the last year; '2' = 1-2 years ago; '3' = 2-3 years ago; '4' = 3-4 years ago; '5' = 4-5 years ago; and '6' = more than 5 years ago)	5.09	1.54	1	6	3,490
Turnover in account manager ("Within the last 3 years, how many different account managers have you dealt with at your primary financial institution?" '1' = one; '2' = two' '3' = three; '4' = four; '5' = five or more)	1.71	0.90	1	5	3,359
Firm characteristics					
Years in business	16.0	13.40	1	99	3,617
Gross sales during last fiscal year ($000)	$ 2,339	$ 8,280	$ 1	$ 99,000	3,353
Full-time equivalent employees	15	42.50	0.5	999	3,597
Form of business					
Proprietorship ('1' = Yes)	0.06	0.23	0	1	3,642
Partnership ('1' = Yes)	0.31	0.46	0	1	3,642
S-Corporation ('1' = Yes)	0.21	0.40	0	1	3,642
Corporate ('1' = Yes)	0.42	0.49	0	1	3,642
Sales growth ("Which category best describes your average annual change in your gross sales over the past 3 years?" '1' = Declined more than 5%; '2' = No change (-5% to +5%); '3' = Grew 6% - 10%; '4' = Grew 11% to 20%; '5' = Grew 20% or more)	2.75	1.21	1	5	3,431

Table 2

Bivariate Analysis of Merger/Acquisition Experience with Access to Credit, Loan Terms and Service Quality Measures

	Financial Institution Bought or Absorbed in Past 3 Years		
Access to Credit Variables	**Yes**	**No**	**t***
Denied credit in last loan attempt	0.12	0.12	0.1
All borrowing needs Not met over past 3 years	0.33	0.27	3.4
Actively shopped for a different bank	0.30	0.24	3.4
Number of applications at banks	1.54	1.41	2.9
Loan Terms/Fees Variables			
Average loan rate	9.35%	9.48%	(1.4)
Collateral assignment required	0.70	0.64	2.7
Other financial services business required	0.35	0.25	4.6
Number of services with fees	3.64	3.47	4.8
Fees per unit of service	3.72	3.55	5.2
Market and Bank Structure			
Market size			
Small (under 20,000)	0.20	0.25	(3.4)
Mid (between 20,000 and 1 million)	0.22	0.24	(1.2)
Large (1 million or more)	0.59	0.51	3.7
Competition for business	3.37	3.45	(2.4)
Bank size			
Small (assets under $100 million)	0.15	0.23	(5.2)
Medium (assets between $.1 - $1.0 billion)	0.28	0.28	0.5
Large (assets exceed $1 billion)	0.46	0.36	5.4
Service Characteristic			
Accesibility of account manager	1.93	2.07	(6.2)
Services offered	1.96	2.13	(6.9)
Capability of the staff	1.88	2.05	(7.7)
Continuity of account manager	1.82	1.99	(7.1)
Lending criteria	1.74	1.91	(6.8)

* The t-tests for differences in mean responses is calculated assuming unequal variances.

Table 3
Definition of Dependent Variables

	Mean	Estimation Method	No. of Obs.
Credit Access			
Turned down ('1' if they did not get a loan the last time that they tried and '0' if they did get the loan). Limited to those firms that applied to commercial banks in the past 3 years.	0.11	Logit	2,333
Borrowing needs not met ('1' if the respondent answered 'No' to the question "Over the last 3 years, was your firm able to satisfy its borrowing needs at all times and '0' if they reported 'Yes'). Limited to those firms that applied for a loan in the past 3 years and who were NOT turned down.	0.20	Logit	1,791
Shopped for new bank ("1" if the respondent answered 'Yes' to the question, "Within the last 3 years, did you actively shop for a different financial institution to service your business needs," and '"0" if they answered 'No.') Limited to firms that were NOT turned down on their last loan request at a commercial bank within the past 3 years and did not change banks as a result of a merger.	0.32	Logit	1,848
Number of loan applications ("From how many financial instiutions in total did you TRY to get a loan before you were successfulor stopped trying? (EXCLUDE private individuals)") Limited to those firms that applied for a loan at a commercial bank in the past 3 years and were successful and did not change banks as a result of a merger.	1.36	Tobit	1,723
Loan Terms			
Interest rate (contract rate paid on the most recent loan). Limited to loans made in the last 3 years from a commercial bank.	9.12%	Tobit	1,559
Collateral ('1' if the respondent answered 'Yes' to the quesiton "Was business and/or personal collateral required?" and '0' if they answered 'No') Limited to firms that received a loan from a commercial bank in the past 3 years.	0.68	Logit	1,702
Financial services required ('1' if the respondent answered 'Yes' to the question "Was your business required to conduct other financial activities with the lender, e.g., maintaining a checking account?" and '0' if they answered 'No') Limited to firms that received a loan from a commercial bank in the past 3 years.	0.30	Logit	1,764
Number of fees ("Over the last 12 months, have the number of services on which you pay fees:" '1' = Increased substantially or increased slightly, and '0' otherwise) Limited to firms that received a loan from a commercial bank in the past 3 years.	0.42	Logit	1,690
Fees per unit ("Over the last 12 months, have the fees per unit of service:" '1' = Increased substantially or increased slightly; and '0' otherwise) Limited to firms that received a loan from a commercial bank in the past 3 years.	0.50	Logit	3,177
Quality of Service:			
"Over the last 3 years, have you noticed a change in the following characteristics of the financial institution your firm has dealt with most often?" '3' if the respondent reported 'Better', '2' if 'No Change' and '1' if 'Worse' . Limited to firms that received a loan from a commercial bank in the past 3 years.			
Accessibility of account manager	2.05	Tobit	1,951
Services offered	2.10	Tobit	1,972
Capability of the staff	2.01	Tobit	1,961
Continuity of account manager	1.95	Tobit	1,928
Lending criteria	1.86	Tobit	1,920

Table 4

Multivariate Results for Merger/Acquisition Experience and Access to Credit

Logistic regression is used for equations (1) - (3), while TOBIT is used in equation (4). The number of cases for each equation include only those firms that attempted a loan at a commercial bank within three years of the survey. The sample in equation (2) is further restricted to firms that were successful in their most recent loan search and equation (3) is further restricted to those firms that did not switch banks as a result of a merger. The critical values for the Wald chi-square test with one degree of freedom at the 1%, 5% and 10% levels are 6.64, 3.84 and 2.71, respectively. The critical values for a two-tailed t-test at the 1%, 5% and 10% levels are 2.58, 1.96, and 1.65 respectively. The Cox & Snell R-squared is given for the logistic regressions.

In Panel B the the sub-sample cofficients on "Lead bank merged/absorbed in last 3 years" are presented for three different independent variables. The first stratification by years in business: the first sub-sample is "Young" that includes firms that have been in business 5 years or less, the 10th percentile of the distribution and the second sub-sample is "Old" that includes firms that have been in business at least 25 years, the 90th percentile of the distribution. The second stratification is by bank size: "Large" is for firms currently doing business at banks with assets exceeding $1 billion and "Small" for those firms currently doing business at banks with asset size under $100 million. The third stratification is by market size: "Large" is for firms located in cities with populations of 1 million or more and "Small" is for those firms living in cities with a population under 20,000 or rural areas.

	(1) Denied Credit on Last Attempt			(2) All Credit Needs Not Met			(3) Shopped for a New Bank			(4) Number of Applications		
A. Fully Specifed Model Estimates	**Coeff.**	**S.E.**	**Wald Chi-sq**	**Coeff.**	**S.E.**	**Wald Chi-Sq**	**Coeff.**	**S.E.**	**Wald Chi-Sq**	**Coeff.**	**S.E.**	**t**
Lead bank merged/absorbed in last 3 years	(0.235)	0.176	1.77	0.201	0.161	1.56	0.605	0.138	19.21	0.374	0.222	1.69
Competition for business has increased (log)	(0.384)	0.224	2.94	(0.604)	0.222	7.38	0.184	0.207	0.79	(0.289)	0.426	(0.68)
Small market (rural, small city)	(0.534)	0.210	6.46	(0.320)	0.196	2.69	0.060	0.160	0.14	(0.852)	0.436	(1.96)
Mid market (city)	(0.644)	0.206	9.79	(0.107)	0.182	0.35	0.259	0.155	2.81	0.299	0.491	0.61
Small bank (Less than $100 million in assets)	(0.249)	0.218	1.30	0.133	0.199	0.44	0.029	0.169	0.03	0.729	0.456	1.60
Medium bank ($0.10 - 1.0 billion in assets)	0.007	0.174	0.00	0.079	0.174	0.21	(0.199)	0.147	1.84	0.656	0.383	1.71
R-squared	0.06			0.08			0.29			0.18		
B. Sub-sample coefficient estimates for "Lead bank merged/absorbed in last 3 years"												
1. Years in Business												
"Young" firms (age<=5): 10th percentile cutoff	(0.117)	0.353	0.11	(0.431)	0.429	1.01	(0.097)	0.397	0.06	0.459	0.472	0.97
"Old" firms (age>=25):90th percentile cutoff	(1.168)	0.603	3.75	(0.233)	0.464	0.25	0.694	0.367	3.58	0.132	0.507	0.26
2. Bank Size												
Large bank ($1 billion in assets or more)	(0.605)	0.282	4.60	(0.064)	0.24	0.07	0.425	0.21	4.04	0.415	0.299	1.39
Small bank (under $100 million)	(0.291)	0.490	0.35	0.355	0.36	1.00	0.641	0.36	3.25	0.106	0.562	0.19
3. Market Size												
Large market (over 1 million)	(0.456)	0.225	4.12	0.379	0.20	3.72	0.396	0.16	6.06	0.294	0.299	0.98
Small market (under 20,000)	(0.242)	0.447	0.29	(0.095)	0.36	0.07	0.411	0.29	1.97	(0.520)	0.441	(1.18)

Table 5

Multivariate Results for Merger/Absorption on Small Business Loan Terms

TOBIT regression is used for equation (1) and logistic regression is used for equations (2), (3), (4), and (5). The number of cases includes only those firms that were successful in their most recent loan attempt at a commercial bank within three years of the survey. The critical values for the Wald chi-square test with one degree of freedom at the 1%, 5% and 10% levels are 6.64, 3.84 and 2.71, respectively. The critical values for a two-tailed t-test at the 1%, 5% and 10% levels are 2.58, 1.96, and 1.65 respectively. The Cox & Snell R-squared is given for the logistic regression equations.

In Panel B the the sub-sample cofficients on "Lead bank merged/absorbed in last 3 years" are presented for three different independent variables. The first stratification by years in business: the first sub-sample is "Young" that includes firms that have been in business 5 years or less, the 10th percentile of the distribution and the second sub-sample is "Old" that includes firms that have been in business at least 25 years, the 90th percentile of the distribution. The second stratification is by bank size: "Large" is for firms currently doing business at banks with assets exceeding $1 billion and "Small" for those firms currently doing business at banks with asset size under $100 million. The third stratification is by market size: "Large" is for firms located in cities with populations of 1 million or more and "Small" is for those firms living in cities with a population under 20,000 or rural areas.

	(1) Interest Rate on Most Recent Loan			(2) Collateral Assignment			(3) Other Financial Services Required			(4) Number of Services With Fees			(5) Fees per Unit Of Service		
A. Fully Specifed Model Estimates	**Coeff.**	**S.E.**	**t**	**Coeff.**	**S.E.**	**Wald Chi-Sq**	**Coeff.**	**S.E.**	**Wald Chi-Sq**	**Coeff.**	**S.E.**	**Wald Chi-Sq**	**Coeff.**	**S.E.**	**Wald Chi-Sq**
Lead bank merged/absorbed in last 3 years	(0.124)	0.093	(1.34)	0.281	0.140	4.05	0.278	0.134	4.32	0.331	0.120	7.58	0.380	0.123	9.53
Competition for business has increased	(0.246)	0.136	(1.80)	0.089	0.209	0.18	(0.519)	0.200	6.73	(0.402)	0.181	4.94	(0.382)	0.188	4.14
Small market (rural, small city)	0.161	0.097	1.66	0.086	0.152	0.32	(0.176)	0.158	1.24	0.021	0.136	0.02	0.189	0.137	1.90
Mid market (city)	(0.054)	0.110	(0.49)	0.058	0.147	0.15	0.025	0.148	0.03	0.125	0.132	0.90	0.087	0.134	0.42
Small bank (Less than $100 million in assets)	0.214	0.108	1.98	0.283	0.163	3.03	(0.051)	0.163	0.10	(0.072)	0.144	0.25	(0.352)	0.146	5.82
Medium bank ($0.10 - 1.0 billion in assets)	0.080	0.095	0.84	0.061	0.137	0.20	(0.165)	0.141	1.37	(0.009)	0.124	0.01	(0.223)	0.126	3.15
R-squared				0.11			0.10								
B. Sub-sample coefficient estimates for "Lead bank merged/absorbed in last 3 years"															
1. Years in Business															
"Young" firms (age<=5): 10th percentile cutoff	(0.187)	0.263	(0.71)	0.273	0.402	0.46	(0.192)	0.416	0.21	(0.121)	0.348	0.12	(0.282)	0.363	0.601
"Old" firms (age>=25):90th percentile cutoff	(0.323)	0.223	(1.44)	0.203	0.328	0.38	0.360	0.337	1.14	0.083	0.309	0.07	0.499	0.304	2.70
2. Bank Size															
Large bank ($1 billion in assets or more)	0.012	0.129	0.09	0.288	0.221	1.70	0.174	0.210	0.69	0.037	0.192	0.04	0.190	0.195	0.95
Small bank (under $100 million)	(0.343)	0.171	(2.00)	0.103	0.346	0.09	0.586	0.326	3.22	0.641	0.293	4.79	0.413	0.294	1.98
3. Market Size															
Large market (over 1 million)	0.104	0.126	0.83	0.422	0.202	4.37	0.300	0.187	2.57	0.335	0.171	3.83	0.422	0.177	5.66
Small market (under 20,000)	(0.307)	0.178	(1.73)	(0.150)	0.289	0.27	(0.061)	0.319	0.04	0.425	0.260	2.67	0.413	0.258	2.56

Table 6

Multivariate Results for Merger/Acquisition Experience and Service Characteristics

Tobit regression is used for equations (1) - (5) and the sample includes only those firms that attempted a loan at a commercial bank within three years of the survey. The critical values for a two-tailed t-test at the 1%, 5% and 10% levels are 2.58, 1.96, and 1.65 respectively.

In Panel B the the sub-sample cofficients on "Lead bank merged/absorbed in last 3 years" are presented for three different independent variables. The first stratification by years in business: the first sub-sample is "Young" that includes firms that have been in business 5 years or less, the 10th percentile of the distribution and the second sub-sample is "Old" that includes firms that have been in business at least 25 years, the 90th percentile of the distribution. The second stratification is by bank size: "Large" is for firms currently doing business at banks with assets exceeding $1 billion and "Small" for those firms currently doing business at banks with asset size under $100 million. The third stratification is by market size: "Large" is for firms located in cities with populations of 1 million or more and "Small" is for those firms living in cities with a population under 20,000 or rural areas.

	(1) Accessibility of Account Manager			(2) Services Offered			(3) Capability of Staff			(4) Continuity of Account Manager			(5) Lending Criteria		
A. Fully Specifed Model Estimates	**Coeff.**	**S.E.**	**t**	**Coeff.**	**S.E.**	**t**	**Coeff.**	**S.E.**	**Chi-Sq**	**Coeff.**	**S.E.**	**t**	**Coeff.**	**S.E.**	**t**
Lead bank merged/absorbed in last 3 years	(0.103)	0.039	(2.63)	(0.168)	0.046	(3.66)	(0.173)	0.040	(4.29)	(0.110)	0.040	(2.77)	(0.144)	0.051	(2.83)
Competition for business has increased (log)	0.464	0.056	8.23	0.469	0.065	7.20	0.410	0.058	7.12	0.270	0.056	4.80	0.561	0.075	7.46
Small market (rural, small city)	(0.036)	0.041	(0.88)	(0.018)	0.048	(0.38)	0.006	0.042	0.15	0.031	0.041	0.76	(0.012)	0.052	(0.23)
Mid market (city)	(0.004)	0.047	(0.09)	(0.002)	0.055	(0.04)	0.071	0.048	1.47	0.015	0.047	0.32	0.001	0.060	0.02
Small bank (Less than $100 million in assets)	0.062	0.047	1.33	0.023	0.054	0.42	(0.039)	0.048	(0.81)	0.078	0.047	1.66	0.087	0.060	1.46
Medium bank ($0.10 - 1.0 billion in assets)	0.082	0.039	2.08	0.094	0.046	2.04	0.050	0.040	1.24	0.086	0.040	2.18	0.074	0.051	1.45
R-squared	0.14			0.10			0.11			0.18			0.12		
B. Sub-sample coefficient estimates for "Lead bank merged/absorbed in last 3 years"															
1. Years in Business															
"Young" firms (age<=5):10th percentile cutoff	(0.079)	0.050	(1.58)	(0.181)	0.059	(3.06)	(0.232)	0.050	(4.64)	(0.117)	0.052	(2.26)	(0.095)	0.066	(1.44)
"Old" firms (age>=25):90th percentile cutoff	(0.181)	0.085	(2.13)	(0.052)	0.106	(0.49)	(0.007)	0.095	(0.08)	(0.140)	0.089	(1.58)	(0.254)	0.114	(2.23)
2. Bank Size															
Large bank ($1 billion in assets or more)	(0.117)	0.069	(1.69)	(0.182)	0.07	(2.434)	(0.137)	0.07	(1.98)	(0.102)	0.072	(1.42)	(0.108)	0.078	(1.38)
Small bank (under $100 million)	(0.158)	0.084	(1.90)	(0.172)	0.10	(1.709)	(0.275)	0.08	(3.26)	(0.152)	0.077	(1.99)	(0.168)	0.113	(1.49)
3. Market Size															
Large market (over 1 million)	(0.092)	0.060	(1.53)	(0.183)	0.07	(2.675)	(0.172)	0.06	(2.87)	(0.090)	0.059	(1.51)	(0.123)	0.077	(1.60)
Small market (under 20,000)	(0.066)	0.060	(1.09)	(0.152)	0.08	(2.022)	(0.136)	0.07	(1.97)	(0.094)	0.061	(1.54)	(0.092)	0.084	(1.10)

Appendix A-1: Credit Access Equations

Denied Credit on Last Attempt

	B	S.E.	Wald	Sig.
MERGEDR	(0.235)	0.176	1.77	0.18
LNCOMPET	(0.384)	0.224	2.94	0.09
MKTSM	(0.534)	0.210	6.46	0.01
MKTMID	(0.644)	0.206	9.79	0.00
SMBANK	(0.249)	0.218	1.30	0.25
MEDBANK	0.007	0.174	0.00	0.97
LGTHRELR	(0.065)	0.046	2.06	0.15
MGRTURNR	0.212	0.079	7.18	0.01
LNFTE	(0.113)	0.079	2.05	0.15
LNAGE	(0.369)	0.099	13.98	-
SGROWTHR	(0.135)	0.064	4.46	0.04
FBCORP	(0.336)	0.188	3.21	0.07
FBSCORP	(0.294)	0.218	1.81	0.18
MINORITY	0.644	0.265	5.93	0.02
FEMALE	0.549	0.225	5.93	0.02
BOTHSEX	0.064	0.200	0.10	0.75
INDAGRIC	(0.432)	0.346	1.56	0.21
INDCONST	0.063	0.271	0.06	0.82
INDFIN	(0.184)	0.379	0.24	0.63
INDMANF	(0.131)	0.281	0.22	0.64
INDPROF	0.356	0.333	1.14	0.29
INDSERV	0.505	0.213	5.60	0.02
INDTRANS	0.685	0.405	2.86	0.09
INDWHOLE	(0.142)	0.363	0.15	0.70
NEAST	0.443	0.243	3.33	0.07
SOUTH	(0.240)	0.264	0.83	0.36
SWESTMTN	0.113	0.244	0.21	0.64
FWEST	0.422	0.249	2.87	0.09
PLAINS	(0.100)	0.298	0.11	0.74
Constant	(0.053)	0.551	0.01	0.92

All Credit Needs NOT Met

	B	S.E.	Wald	Sig.
MERGEDR	0.201	0.161	1.56	0.21
LNCOMPET	(0.604)	0.222	7.38	0.01
MKTSM	(0.320)	0.196	2.69	0.10
MKTMID	(0.107)	0.182	0.35	0.56
SMBANK	0.133	0.199	0.44	0.51
MEDBANK	0.079	0.174	0.21	0.65
LGTHRELR	(0.262)	0.041	40.23	-
MGRTURNR	0.383	0.076	25.56	-
LNFTE	(0.047)	0.075	0.39	0.54
LNAGE	(0.131)	0.101	1.67	0.20
SGROWTHR	(0.111)	0.065	2.97	0.09
FBCORP	0.221	0.192	1.33	0.25
FBSCORP	0.267	0.216	1.53	0.22
MINORITY	0.361	0.309	1.37	0.24
FEMALE	(0.236)	0.288	0.67	0.41
BOTHSEX	(0.115)	0.194	0.35	0.55
INDAGRIC	0.582	0.260	5.02	0.03
INDCONST	0.009	0.256	0.00	0.97
INDFIN	0.241	0.338	0.51	0.48
INDMANF	0.046	0.247	0.03	0.85
INDPROF	0.398	0.336	1.41	0.24
INDSERV	(0.150)	0.240	0.39	0.53
INDTRANS	0.230	0.477	0.23	0.63
INDWHOLE	0.003	0.323	-	0.99
NEAST	0.458	0.234	3.82	0.05
SOUTH	0.113	0.237	0.23	0.64
SWESTMTN	0.203	0.229	0.79	0.38
FWEST	0.153	0.260	0.35	0.56
PLAINS	(0.121)	0.276	0.19	0.66
Constant	(0.048)	0.556	0.01	0.93

Shopped for a New Bank

	B	S.E.	Wald	Sig.
MERGEDR	0.605	0.138	19.21	-
LNCOMPET	0.184	0.207	0.79	0.38
MKTSM	0.060	0.160	0.14	0.71
MKTMID	0.259	0.155	2.81	0.09
SMBANK	0.029	0.169	0.03	0.86
MEDBANK	(0.199)	0.147	1.84	0.18
LGTHRELR	(0.792)	0.047	286.06	-
MGRTURNR	0.531	0.071	55.35	-
LNFTE	0.108	0.062	3.03	0.08
LNAGE	(0.095)	0.084	1.28	0.26
SGROWTHR	(0.043)	0.053	0.65	0.42
FBCORP	(0.094)	0.157	0.36	0.55
FBSCORP	(0.439)	0.186	5.60	0.02
MINORITY	0.304	0.272	1.25	0.26
FEMALE	0.045	0.221	0.04	0.84
BOTHSEX	0.066	0.160	0.17	0.68
INDAGRIC	0.197	0.236	0.70	0.40
INDCONST	(0.186)	0.212	0.77	0.38
INDFIN	0.197	0.294	0.45	0.50
INDMANF	0.113	0.206	0.30	0.58
INDPROF	0.223	0.293	0.58	0.45
INDSERV	(0.005)	0.195	0.00	0.98
INDTRANS	0.655	0.337	3.78	0.05
INDWHOLE	(0.070)	0.271	0.07	0.80
NEAST	0.194	0.207	0.88	0.35
SOUTH	0.258	0.194	1.76	0.19
SWESTMTN	0.157	0.192	0.67	0.41
FWEST	(0.081)	0.221	0.14	0.71
PLAINS	0.063	0.217	0.08	0.77
Constant	2.041	0.495	16.98	-

Number of Applications

	Coeff.	Std.Err.	t-ratio	P-value
MERGEDR	0.374	0.222	1.69	0.09
LNCOMPET	(0.383)	0.297	(1.29)	0.20
MKTSM	(0.287)	0.241	(1.19)	0.23
MKTMID	(0.211)	0.272	(0.77)	0.44
SMBANK	0.295	0.268	1.10	0.27
MEDBANK	0.215	0.229	0.94	0.35
LGTHRELR	(0.430)	0.060	(7.15)	0.00
MGRTURNR	0.496	0.106	4.68	0.00
LNFTE	0.048	0.096	0.50	0.62
LNAGE	(0.319)	0.131	(2.44)	0.01
SGROWTHR	(0.184)	0.083	(2.23)	0.03
FBCORP	(0.276)	0.251	(1.10)	0.27
FBSCORP	(0.211)	0.286	(0.74)	0.46
MINORITY	1.074	0.388	2.77	0.01
FEMALE	0.099	0.342	0.29	0.77
BOTHSEX	0.229	0.252	0.91	0.36
INDCONST	(0.425)	0.351	(1.21)	0.23
INDMANF	0.286	0.320	0.89	0.37
INDTRANS	0.529	0.556	0.95	0.34
INDWHOLE	0.368	0.427	0.86	0.39
INDAGRIC	(0.032)	0.387	(0.08)	0.93
INDFIN	0.044	0.444	0.10	0.92
INDSERV	0.124	0.295	0.42	0.67
INDPROF	(0.357)	0.473	(0.75)	0.45
NEAST	0.536	0.309	1.74	0.08
SOUTH	(0.047)	0.312	(0.15)	0.88
SWESTMTN	-0.02333	0.30031	(0.08)	0.94
FWEST	0.23021	0.33414	0.69	0.49
PLAINS	-0.72128	0.36524	(1.97)	0.05
ONE	1.58508	0.73206	2.17	0.03
Sigma	2.79476	0.12564	22.24	0.00

VARIABLE NAMES

MERGEDR	Primary bank merged within last 3 years
LNCOMPET	(Log) Competition Assessment
MKTSM	Small market
MKTMID	Medium market
SMBANK	Small bank
MEDBANK	Medium bank
LGTHRELR	Length of banking relationship
MGRTURNR	Account manager turnover
LNFTE	Log full-time equivalent employment
LNAGE	Log years in business
SGROWTH	Annual change in sales during past 3 years
MINORITY	Minority owned business
FEMALE	Female owned business
BOTHSEX	Jointly owned business
INDAGRIC	Agriculture
INDCONST	Construction
INDFIN	Financial services
INDMANF	Manufacturing
INDPROF	Professional services
INDSERV	Non-professional services
INDTRANS	Transportation
INDWHOLE	Wholesale
FBCORP	Corporation
FBSCORP	S-Corporation
NEAST	Northeast
SOUTH	South
SWESTMTN	Southwest/Mountain
FWEST	Far West
PLAINS	Plains
COLLATY	Collateral assignment required
FINSERVY	Other financial services required
LN10_20	Loan size: $10-20 thousand
LN20_40	Loan size: $20-40 thousand
LN40_100	Loan size: $40-100 thousand
LN1_300	Loan size: $100-300 thousand
LNGT300	Loan size: over $300,000
MAT12_60	Maturity: 12-60 months
MAT60UP	Maturity: over 60 months
LIBOR	3 month LIBOR
DEFAULT	Baa - 10 year USTreasury yield
TERMP	Term premium
FLOAT	Floating rate loan

Limited Dependent Variable Model - CENSORED Regression |
| Ordinary least squares regression Weighting variable = none |
| Dep. var. = BSEARCHR Mean= 2.167487685 , S.D.= 1.4077 |
| Model size: Observations = 203, Parameters = 30, Deg.Fr.= 173 |
| Residuals: Sum of squares= 329.563 , Std.Dev.= 1.38021 |
| Fit: R-squared= .176720, Adjusted R-squared = .03871 |
| Model test: F[29, 173] = 1.28, Prob value = .16816 |
| Diagnostic: Log-L = -337.2276, Restricted(b=0) Log-L = -356.97|
| LogAmemiyaPrCrt.= .782, Akaike Info. Crt.= 3.618

Appendix A-2: Loan Term Equations

Interest Rate on Most Recent Loan

	Coeff.	Std.Err.	t-ratio	P-value
MERGEDR	(0.156)	0.098	(1.60)	0.11
LNCOMPET	(0.296)	0.140	(2.11)	0.03
MKTSM	0.134	0.102	1.31	0.19
MKTMID	0.007	0.116	0.06	0.95
SMBANK	0.124	0.114	1.09	0.28
MEDBANK	0.115	0.099	1.16	0.24
LGTHRELR	(0.018)	0.028	(0.64)	0.52
MGRTURNR	(0.004)	0.048	(0.08)	0.94
LNFTE	(0.115)	0.047	(2.47)	0.01
LNAGE	(0.080)	0.058	(1.39)	0.16
SGROWTHR	(0.013)	0.036	(0.36)	0.72
FBCORP	0.087	0.109	0.80	0.42
FBSCORP	(0.039)	0.124	(0.32)	0.75
MINORITY	0.161	0.194	0.83	0.41
FEMALE	0.023	0.150	0.15	0.88
BOTHSEX	(0.152)	0.109	(1.40)	0.16
INDAGRIC	(0.120)	0.162	(0.74)	0.46
INDCONST	(0.006)	0.142	(0.04)	0.97
INDFIN	0.021	0.194	0.11	0.91
INDMANF	0.232	0.144	1.61	0.11
INDPROF	0.042	0.205	0.20	0.84
INDSERV	0.427	0.133	3.22	0.00
INDTRANS	(0.174)	0.247	(0.71)	0.48
INDWHOLE	(0.189)	0.186	(1.02)	0.31
NEAST	0.261	0.143	1.82	0.07
SOUTH	(0.111)	0.135	(0.83)	0.41
SWESTMTN	0.369	0.131	2.81	0.00
FWEST	0.914	0.150	6.10	0.00
PLAINS	0.033	0.146	0.23	0.82
LN10_20	(0.134)	0.145	(0.92)	0.36
LN20_40	(0.443)	0.145	(3.05)	0.00
LN40_100	(0.506)	0.136	(3.71)	0.00
LN1_300	(0.562)	0.160	(3.51)	0.00
LNGT300	(0.576)	0.176	(3.28)	0.00
COLLATY	0.082	0.091	0.89	0.37
FINSERVY	0.094	0.097	0.97	0.33
LIBOR	0.770	0.064	11.99	0.00
DEFAULT	1.963	0.284	6.91	0.00
TERMP	(0.131)	0.049	(2.68)	0.01
FLOAT	(0.508)	0.092	(5.51)	0.00
LIBORNA	6.965	0.751	9.27	0.00
ONE	3.360	0.834	4.03	0.00
Sigma	1.665	0.029	56.88	0.00

Limited Dependent Variable Model - CENSORED Regression
| Ordinary least squares regression Weighting variable = none |
| Dep. var. = RATE Mean= 9.137891, S.D.= 1.8655|
| Model size: Observations = 1631, Parameters = 42, Deg.Fr.= 1589|
| Residuals:Sum of squares= 4540.793506, Std.Dev.=1.69046 |
| Fit: R-squared= .199533, Adjusted R-squared = .1789 |
| Model test: F[41, 1589] = 9.66, Prob value = .00000 |
| Diagnostic: Log-L = -3149.29, Restricted(b=0) Log-L =-3330.78 |
| LogAmemiyaPrCrt.= 1.075, Akaike Info. Crt.= 3.913

Collateral Assignment

	B	S.E.	Wald	Sig.
MERGEDR	0.281	0.140	4.05	0.04
LNCOMPET	0.089	0.209	0.18	0.67
MKTSM	0.086	0.152	0.32	0.57
MKTMID	0.058	0.147	0.15	0.70
SMBANK	0.283	0.163	3.03	0.08
MEDBANK	0.061	0.137	0.20	0.66
LGTHRELR	(0.098)	0.043	5.13	0.02
MGRTURNR	0.216	0.283	0.16	0.00
LNFTE	0.022	0.061	0.14	0.73
LNAGE	(0.110)	(0.098)	0.04	0.18
SGROWTHR	0.010	0.216	0.07	0.85
FBCORP	0.123	0.022	0.07	0.42
FBSCORP	0.092	(0.110)	0.08	0.60
MINORITY	(0.229)	0.010	0.05	0.39
FEMALE	(0.111)	0.123	0.15	0.59
BOTHSEX	0.073	0.092	0.17	0.64
INDAGRIC	(0.011)	(0.229)	0.27	0.96
INDCONST	0.187	(0.111)	0.21	0.34
INDFIN	(0.348)	0.073	0.16	0.19
INDMANF	0.045	(0.011)	0.23	0.82
INDPROF	(0.372)	0.187	0.20	0.19
INDSERV	0.008	(0.348)	0.26	0.97
INDTRANS	0.425	0.045	0.20	0.27
INDWHOLE	(0.056)	(0.372)	0.28	0.83
NEAST	(0.028)	0.008	0.18	0.89
SOUTH	0.053	0.425	0.39	0.77
SWESTMTN	0.200	(0.056)	0.26	0.27
FWEST	(0.084)	(0.028)	0.20	0.69
PLAINS	0.395	0.053	0.19	0.05
LN10_20	0.144	0.200	0.18	0.44
LN20_40	0.592	(0.084)	0.21	0.00
LN40_100	0.624	0.395	0.20	0.00
LN1_300	1.090	0.144	0.19	-
LNGT300	1.300	0.592	0.19	-
M1336	0.236	0.624	0.18	0.13
M3760	0.701	1.090	0.23	-
M61120	0.925	1.300	0.26	-
M120PLUS	0.918	0.236	0.15	0.01
FSERVY	0.398	0.701	0.17	0.00
Constant	(0.290)	0.925	0.26	0.57

Other Financial Services Required

	B	S.E.	Wald	Sig.
MERGEDR	0.278	0.134	4.32	0.04
LNCOMPET	(0.519)	0.200	6.73	0.01
MKTSM	(0.176)	0.158	1.24	0.27
MKTMID	0.025	0.148	0.03	0.86
SMBANK	(0.051)	0.163	0.10	0.76
MEDBANK	(0.165)	0.141	1.37	0.24
LGTHRELR	(0.186)	0.037	25.49	-
MGRTURNR	0.226	0.067	11.45	0.00
LNFTE	0.093	0.063	2.13	0.14
LNAGE	(0.088)	0.082	1.16	0.28
SGROWTHR	(0.092)	0.052	3.08	0.08
INDAGRIC	0.157	0.226	0.48	0.49
INDCONST	(0.089)	0.202	0.20	0.66
INDFIN	0.013	0.281	0.00	0.96
INDMANF	(0.207)	0.200	1.07	0.30
INDPROF	0.507	0.274	3.42	0.06
INDSERV	(0.170)	0.192	0.78	0.38
INDTRANS	(0.268)	0.393	0.47	0.50
INDWHOLE	(0.132)	0.258	0.26	0.61
FBCORP	0.101	0.158	0.41	0.52
FBSCORP	0.263	0.175	2.25	0.13
MINORITY	0.082	0.270	0.09	0.76
FEMALE	(0.114)	0.222	0.26	0.61
BOTHSEX	(0.193)	0.159	1.46	0.23
NEAST	0.283	0.198	2.04	0.15
SOUTH	(0.153)	0.194	0.63	0.43
SWESTMTN	0.280	0.184	2.32	0.13
FWEST	0.320	0.206	2.41	0.12
PLAINS	(0.052)	0.214	0.06	0.81
LN10_20	(0.096)	0.231	0.17	0.68
LN20_40	0.344	0.212	2.65	0.10
LN40_100	0.358	0.201	3.17	0.08
LN1_300	0.564	0.221	6.50	0.01
LNGT300	0.81	0.236	11.77	0.00
COLLATY	0.35	0.135	6.74	0.01
Constant	(0.105)	0.494	0.05	0.83

Number of Services with Fees (increased)

	B	S.E.	Wald	Sig.
MERGEDR	0.331	0.120	7.58	0.01
LNCOMPET	(0.402)	0.181	4.94	0.03
MKTSM	0.021	0.136	0.02	0.88
MKTMID	0.125	0.132	0.90	0.34
SMBANK	(0.072)	0.144	0.25	0.62
MEDBANK	(0.009)	0.124	0.01	0.94
LGTHRELR	(0.005)	0.035	0.02	0.89
MGRTURNR	0.267	0.061	19.11	-
LNFTE	(0.033)	0.053	0.37	0.54
LNAGE	(0.154)	0.072	4.55	0.03
SGROWTHR	(0.130)	0.046	7.83	0.01
INDAGRIC	(0.075)	0.200	0.14	0.71
INDCONST	(0.142)	0.176	0.66	0.42
INDFIN	0.095	0.241	0.16	0.69
INDMANF	(0.422)	0.179	5.57	0.02
INDPROF	0.160	0.258	0.38	0.54
INDSERV	(0.201)	0.163	1.52	0.22
INDTRANS	(0.128)	0.328	0.15	0.70
INDWHOLE	(0.211)	0.228	0.86	0.36
FBCORP	(0.025)	0.135	0.03	0.85
FBSCORP	(0.125)	0.154	0.66	0.42
MINORITY	0.252	0.246	1.04	0.31
FEMALE	0.297	0.188	2.50	0.11
BOTHSEX	0.067	0.138	0.24	0.63
NEAST	0.063	0.176	0.13	0.72
SOUTH	0.224	0.166	1.821	0.177
SWESTMTN	0.035	0.164	0.045	0.831
FWEST	(0.029)	0.188	0.025	0.875
PLAINS	0.043	0.180	0.056	0.812
Constant	0.514	0.428	1.443	0.23

Fees per Unit of Service (increased)

	B	S.E.	Wald	Sig.
MERGEDR	0.380	0.123	9.53	0.00
LNCOMPET	(0.382)	0.188	4.14	0.04
MKTSM	0.189	0.137	1.90	0.17
MKTMID	0.087	0.134	0.42	0.52
SMBANK	(0.352)	0.146	5.82	0.02
MEDBANK	(0.223)	0.126	3.15	0.08
LGTHRELR	0.052	0.035	2.20	0.14
MGRTURNR	0.262	0.063	17.30	-
LNFTE	-	0.053	-	0.99
LNAGE	(0.001)	0.073	-	0.99
SGROWTHR	(0.124)	0.047	6.99	0.01
INDAGRIC	0.141	0.206	0.47	0.49
INDCONST	(0.158)	0.179	0.78	0.38
INDFIN	0.332	0.246	1.81	0.18
INDMANF	(0.197)	0.179	1.22	0.27
INDPROF	0.458	0.263	3.04	0.08
INDSERV	0.222	0.167	1.77	0.18
INDTRANS	(0.434)	0.356	1.49	0.22
INDWHOLE	(0.049)	0.226	0.05	0.83
FBCORP	0.051	0.137	0.14	0.71
FBSCORP	0.019	0.157	0.02	0.90
MINORITY	0.303	0.257	1.40	0.24
FEMALE	0.477	0.196	5.93	0.02
BOTHSEX	0.209	0.141	2.19	0.14
NEAST	(0.081)	0.182	0.20	0.66
SOUTH	0.064	0.169	0.15	0.70
SWESTMTN	(0.170)	0.165	1.05	0.31
FWEST	(0.427)	0.189	5.12	0.02
PLAINS	(0.208)	0.182	1.31	0.25
Constant	0.085	0.436	0.04	0.85

Appendix A-3: Service Quality Characteristics

Accessibility of Account Manager

	Coeff.	Std.Err.	t-ratio	P-value
MERGEDR	(0.103)	0.039	(2.63)	0.01
LNCOMPET	0.464	0.056	8.23	0.00
MKTSM	(0.036)	0.041	(0.88)	0.38
MKTMID	(0.004)	0.047	(0.09)	0.93
SMBANK	0.062	0.047	1.33	0.18
MEDBANK	0.082	0.039	2.08	0.04
LGTHRELR	(0.010)	0.011	(0.91)	0.36
MGRTURNR	(0.211)	0.020	(10.73)	0.00
LNFTE	0.054	0.017	3.18	0.00
LNAGE	(0.006)	0.022	(0.28)	0.78
SGROWTHR	0.055	0.015	3.82	0.00
FBCORP	0.032	0.043	0.73	0.46
FBSCORP	0.065	0.050	1.32	0.19
MINORITY	0.121	0.077	1.57	0.12
FEMALE	(0.038)	0.059	(0.64)	0.52
BOTHSEX	0.138	0.044	3.13	0.00
INDCONST	0.079	0.058	1.36	0.17
INDMANF	0.048	0.057	0.84	0.40
INDTRANS	0.077	0.097	0.80	0.42
INDWHOLE	0.002	0.072	0.03	0.98
INDAGRIC	0.214	0.066	3.26	0.00
INDFIN	0.079	0.080	0.99	0.32
INDSERV	0.126	0.052	2.42	0.02
INDPROF	0.137	0.083	1.66	0.10
NEAST	(0.016)	0.057	(0.29)	0.77
SOUTH	(0.101)	0.054	(1.86)	0.06
SWESTMTN	(0.025)	0.052	(0.47)	0.63
FWEST	0.006	0.059	0.10	0.92
PLAINS	0.017	0.059	0.29	0.77
ONE	1.578	0.133	11.89	0.00
Sigma	0.711	0.015	46.89	0.00

Limited Dependent Variable Model - CENSORED Regression |
| Ordinary least squares regression Weighting variable = none |
| Dep. var. = RACCESS Mean= 2.053818555 , S.D.= .5497547|
| Model size: Observations = 1951, Parameters = 30, Deg.Fr.= 1921|
| Residuals: Sum of squares= 507.5645179, Std.Dev.= .51402 |
| Fit:R-squared= .138771, Adjusted R-squared = .12577 |
| Model test: F[29, 1921] = 10.67, Prob value = .00000 |
| Diagnostic: Log-L = -1454.8642, Restricted(b=0) Log-L = -1600.599 |
| LogAmemiyaPrCrt.= -1.316, Akaike Info. Crt.= 1.522

Services Offered

	Coeff.	Std.Err.	t-ratio	P-value
MERGEDR	(0.168)	0.046	(3.66)	0.00
LNCOMPET	0.469	0.065	7.20	0.00
MKTSM	(0.018)	0.048	(0.38)	0.70
MKTMID	(0.002)	0.055	(0.04)	0.96
SMBANK	0.023	0.054	0.42	0.67
MEDBANK	0.094	0.046	2.04	0.04
LGTHRELR	(0.009)	0.013	(0.69)	0.49
MGRTURNR	(0.146)	0.023	(6.39)	0.00
LNFTE	0.066	0.020	3.31	0.00
LNAGE	0.015	0.026	0.56	0.58
SGROWTHR	0.062	0.017	3.64	0.00
FBCORP	0.010	0.050	0.20	0.84
FBSCORP	(0.021)	0.058	(0.36)	0.72
MINORITY	0.161	0.088	1.82	0.07
FEMALE	0.020	0.069	0.28	0.78
BOTHSEX	0.083	0.052	1.61	0.11
INDCONST	0.053	0.068	0.78	0.43
INDMANF	0.094	0.067	1.40	0.16
INDTRANS	(0.019)	0.114	(0.17)	0.87
INDWHOLE	0.020	0.085	0.24	0.81
INDAGRIC	0.208	0.077	2.71	0.01
INDFIN	0.088	0.092	0.95	0.34
INDSERV	0.154	0.061	2.54	0.01
INDPROF	0.059	0.097	0.61	0.54
NEAST	(0.002)	0.066	(0.02)	0.98
SOUTH	(0.013)	0.063	(0.20)	0.84
SWESTMTN	0.003	0.061	0.04	0.97
FWEST	0.035	0.069	0.50	0.62
PLAINS	0.154	0.069	2.22	0.03
ONE	1.450	0.155	9.37	0.00
Sigma	0.829	0.019	44.78	0.00

Limited Dependent Variable Model - CENSORED Regression |
| Ordinary least squares regression Weighting variable = none |
| Dep. var. = RSERVICE Mean= 2.109533469 , S.D.= .5849199|
| Model size: Observations = 1972, Parameters = 30, Deg.Fr.= 1942|
| Residuals: Sum of squares= 610.5333882, Std.Dev.= .56070 |
| Fit: R-squared= .094622, Adjusted R-squared = .08110 |
| Model test: F[29, 1942] = 7.00, Prob value = .00000 |
| Diagnostic: Log-L = -1642.0909, Restricted(b=0) Log-L = -1740.1018|
| LogAmemiyaPrCrt.= -1.142, Akaike Info. Crt.= 1.696

Capability of Staff

	Coeff.	Std.Err.	t-ratio	P-value
MERGEDR	(0.173)	0.040	(4.29)	0.00
LNCOMPET	0.410	0.058	7.12	0.00
MKTSM	0.006	0.042	0.15	0.88
MKTMID	0.071	0.048	1.47	0.14
SMBANK	(0.039)	0.048	(0.81)	0.42
MEDBANK	0.050	0.040	1.24	0.22
LGTHRELR	(0.008)	0.011	(0.68)	0.50
MGRTURNR	(0.196)	0.020	(9.74)	0.00
LNFTE	0.015	0.017	0.84	0.40
LNAGE	0.029	0.023	1.24	0.21
SGROWTHR	0.016	0.015	1.05	0.29
FBCORP	(0.013)	0.044	(0.29)	0.77
FBSCORP	(0.018)	0.051	(0.35)	0.73
MINORITY	0.116	0.078	1.49	0.14
FEMALE	0.018	0.060	0.30	0.77
BOTHSEX	0.059	0.045	1.30	0.19
INDCONST	0.058	0.060	0.97	0.33
INDMANF	0.009	0.059	0.15	0.88
INDTRANS	0.040	0.099	0.40	0.69
INDWHOLE	(0.000)	0.074	(0.01)	0.99
INDAGRIC	0.116	0.067	1.72	0.08
INDFIN	(0.072)	0.081	(0.89)	0.37
INDSERV	(0.018)	0.053	(0.34)	0.73
INDPROF	0.135	0.084	1.60	0.11
NEAST	(0.034)	0.058	(0.59)	0.56
SOUTH	(0.048)	0.055	(0.87)	0.38
SWESTMTN	(0.050)	0.054	(0.93)	0.35
FWEST	(0.085)	0.061	(1.39)	0.16
PLAINS	0.042	0.061	0.69	0.49
ONE	1.784	0.136	13.15	0.00
Sigma	0.731	0.016	46.89	0.00

Limited Dependent Variable Model - CENSORED Regression |
| Ordinary least squares regression Weighting variable = none |
| Dep. var. = RSTAFF Mean= 2.010708822, S.D.= .5536406015|
| Model size: Observations = 1961, Parameters = 30, Deg.Fr.= 1931|
| Residuals: Sum of squares= 535.5018583, Std.Dev.= .52661 |
| Fit: R-squared= .108648, Adjusted R-squared = .09526 |
| Model test: F[29, 1931] = 8.12, Prob value = .00000 |
| Diagnostic: Log-L = -1509.84, Restricted(b=0) Log-L = -1622.62 |
| LogAmemiyaPrCrt.= -1.267, Akaike Info. Crt.= 1.570

Continuity of Account Manager

	Coeff.	Std.Err.	t-ratio	P-value
MERGEDR	(0.110)	0.040	(2.77)	0.01
LNCOMPET	0.270	0.056	4.80	0.00
MKTSM	0.031	0.041	0.76	0.45
MKTMID	0.015	0.047	0.32	0.75
SMBANK	0.078	0.047	1.66	0.10
MEDBANK	0.086	0.040	2.18	0.03
LGTHRELR	(0.017)	0.011	(1.53)	0.13
MGRTURNR	(0.343)	0.020	(16.84)	0.00
LNFTE	0.034	0.017	2.00	0.05
LNAGE	0.015	0.022	0.65	0.52
SGROWTHR	0.031	0.015	2.11	0.03
FBCORP	0.050	0.043	1.17	0.24
FBSCORP	0.060	0.050	1.21	0.23
MINORITY	(0.019)	0.077	(0.25)	0.81
FEMALE	0.010	0.059	0.16	0.87
BOTHSEX	0.057	0.044	1.30	0.19
INDCONST	0.002	0.058	0.04	0.97
INDMANF	(0.007)	0.058	(0.12)	0.90
INDTRANS	(0.100)	0.098	(1.03)	0.30
INDWHOLE	0.005	0.073	0.06	0.95
INDAGRIC	0.212	0.065	3.25	0.00
INDFIN	(0.013)	0.079	(0.17)	0.87
INDSERV	0.025	0.052	0.47	0.64
INDPROF	(0.003)	0.084	(0.04)	0.97
NEAST	(0.010)	0.057	(0.18)	0.86
SOUTH	(0.082)	0.054	(1.51)	0.13
SWESTMTN	0.016	0.053	0.31	0.76
FWEST	(0.034)	0.059	(0.57)	0.57
PLAINS	0.030	0.059	0.50	0.61
ONE	2.000	0.132	15.12	0.00
Sigma	0.705	0.015	46.34	0.00

Limited Dependent Variable Model - CENSORED Regression |
| Ordinary least squares regression Weighting variable = none |
| Dep. var. = RCONTIN Mean= 1.945539419 , S.D.= .5567352565 |
| Model size: Observations = 1928, Parameters = 30, Deg.Fr.= 1898 |
| Residuals: Sum of squares= 487.0222144 , Std.Dev.= .50655 |
| Fit: R-squared= .184602, Adjusted R-squared = .17214 |
| Model test: F[29, 1898] = 14.82, Prob value = .00000 |
| Diagnostic: Log-L = -1409.3182, Restricted(b=0) Log-L = -1606.0504 |
| LogAmemiyaPrCrt.= -1.345, Akaike Info. Crt.= 1.493

Lending Criteria

	Coeff.	Std.Err.	t-ratio	P-value
MERGEDY	(0.144)	0.051	(2.83)	0.00
LGCOMPET	0.561	0.075	7.46	0.00
MKTSM	(0.012)	0.052	(0.23)	0.81
MKTMID	0.001	0.060	0.02	0.99
SMBANK	0.087	0.060	1.46	0.14
MEDBANK	0.074	0.051	1.45	0.15
LGTHREL	(0.003)	0.014	(0.20)	0.84
MGRTURN	(0.252)	0.026	(9.84)	0.00
LOGFTE	0.030	0.022	1.36	0.17
LOGAGE	0.014	0.029	0.47	0.64
SALESG	0.086	0.019	4.63	0.00
FBCORP	0.084	0.055	1.52	0.13
FBSCORP	0.031	0.064	0.49	0.62
MINORITY	(0.041)	0.097	(0.42)	0.68
FEMALE	(0.073)	0.076	(0.96)	0.34
BOTHSEX	0.028	0.056	0.50	0.62
INDCONST	0.014	0.074	0.19	0.85
INDMANF	0.048	0.074	0.64	0.52
INDTRANS	(0.064)	0.125	(0.51)	0.61
INDWHOLE	0.010	0.093	0.10	0.92
INDAGRIC	0.125	0.084	1.49	0.14
INDFIN	0.087	0.100	0.87	0.39
INDSERV	(0.014)	0.067	(0.21)	0.83
INDPROF	(0.014)	0.108	(0.13)	0.90
NEAST	(0.166)	0.073	(2.28)	0.02
SOUTH	(0.098)	0.069	(1.41)	0.16
SWESTMTN	0.029	0.067	0.43	0.67
FWEST	(0.131)	0.076	(1.71)	0.09
PLAINS	(0.036)	0.075	(0.47)	0.64
ONE	1.211	0.173	7.01	0.00
Sigma	0.889	0.021	42.60	0.00

Limited Dependent Variable Model - CENSORED Regression |
| Ordinary least squares regression Weighting variable = none |
| Dep. var. = RCRITER Mean= 1.860416667 , S.D.= .6085167928 |
| Model size: Observations = 1920, Parameters = 30, Deg.Fr.= 1890 |
| Residuals: Sum of squares= 624.3164745 , Std.Dev.= .57474 |
| Fit: R-squared= .121413, Adjusted R-squared = .10793 |
| Model test: F[29, 1890] = 9.01, Prob value = .00000 |
| Diagnostic: Log-L = -1645.8759, Restricted(b=0) Log-L = -1770.1388 |
| LogAmemiyaPrCrt.= -1.092, Akaike Info. Crt.= 1.746

Credit Scoring and Lending to Small Business

By

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Presented at a Conference on

The Changing Banking Structure

and Its Impact on Small Business

Sponsored by

The Office of Advocacy, U.S. Small Business Administration

Washington, DC

June 15, 200

Outline of Presentation

- ***I. Introduction***
- ***II. Motives for Adoption of Scoring***
- ***III. Previous Applications***
- ***IV. Small Business Lending***
- ***V. How widespread is Scoring of Small Business Loans?***
- ***VI. Problems with Scoring***
- ***VII. Studies of Performance of Scoring***
- ***VIII. Conclusions***

I. Introduction

- Credit Scoring Has Become The Dominant Methodology For Granting Many Kinds Of Consumer Loans.
  - Namely, credit cards,direct and indirect consumer loans, revolving credit, auto finance
  - Development And Sale Of Generic Credit Scores By The Three Major Producers Of Credit Information, TransUnion, TRW And Equifax
- Common characteristics
  - Portfolios of large number
  - Low $ volume
  - High cost transactions
  - Potential for diversification benefits

- More recently extended to mortgage lending
  - Home equity lending
  - Residential Real Estate
- Made possible by Standardization Of Instruments
    - Freddie Mac and Fannie Mae Have Encouraged Scoring
- In last 4 years application has spread to commercial loan market

II. Motives for Adoption of Scoring

- Economics
  - Expense Control
  - Narrowing Of Spreads Reduced Profits
  - Need To Economize
  - Reduce Costs
  - Streamline Process
  - Cost Savings Can Be Great
- Uniformity In Lending Policies
- Enhance Productivity
- Better Customer Service
- Control Regulatory Risks

III. Previous Applications

- Predictable credit performance
- Not heavy on relationships
- Not require necessarily face to face meeting
  - Shift here for traditional lenders who discovered CS as way to lower brick and mortar costs

IV. Small Business Lending

- Share many characteristics with other applications
  - Small businesses are very small - over 3/4 have assets under $500K as of 1993.
  - Relatively large number of transactions
  - Relatively low $ amounts - under $100k
  - Potential for geographical diversification
- Makes sense to treat small business lending like lending to individuals
  - Research also has shown that creditworthiness of the small business is critically linked to creditworthiness of the owners, especially for loans under ____K.
- But there are also differences
  - Commercial Loans Were Too Complex For Scoring
  - Firms To Heterogeneous
  - Relationship lending
  - Documentation Not Standard
  - Risks Are More Varied And Complex
  - Not enough data on poor performers

- Despite Problems Efforts To Score Loans Have Been Underway For Several Years -
  - Large Data Bases Like D&B Make Statistical Analysis Possible
  - Fair Issacs and RMA pooled 5 yrs. of data from 17 banks, more than 5k loans from firms with less than $5 million in sales and loans less than $250k
- Political And Economic Development
  - Streamlining Of Securities Laws
  - Remove IRS Impediments
  - 1994 Community Development And Regulatory Improvement Act To Promote Securitization-Regle Act
  - Modification Of Bank Capital Requirements To Incent Investment In Loan-Backed Securities
  - Removed Impediments To Pension Fund And Profit Sharing Plans Ownership Of Business Securities.
  - Community Reinvestment Act
- Hoped for securitiztion has not materialized significantly

V. How widespread is Scoring of Small Business Loans?

- Trend has been stark
- American Banker(May 1995) reported that of some 150 banks surveyed, only 85 of respondents up to $5b. in assets used scoring while 25% of larger banks did
- Jan 1997 FR Senior Loan Officer Survey reported that 70% (38 banks) used scoring (these are large banks, so comparable to 25%)
- 1998 FRB Atlanta survey study of 99 large banks, 63% used scoring and another 11 planned to do so by 1999.
  - All scoring banks used CS for loans less than $100k and 73% used CS for loans less than $250K
    - 42% made accept/reject decision
    - 32% used in setting loan terms
    - 13% used in monitoring loan performance - behavioral scoring
  - 87% used purchased scorecard

VI. Problems with Scoring

- Critics contend that relying on faceless statistical models
  - While meeting regulatory requirements for CRA
  - Perpetuates discriminatory lending patterns
  - Especially in low and moderate income areas

VII. Studies of Performance of Scoring

- Two recent FRB Atlanta studies (Padhi, woosley and Srinivasan (1999) and Frame, Srinivasan and Woosley(2000)) investigate impacts of credit scoring on small business lending in low and moderate income areas
- Look at data from sample of 99 out of the 200 largest US banking organizations in 1997.

- Effect of scoring on availability of credit in LMI areas
  - Non-scoring banks made significantly fewer loans in LMI areas than did scoring banks.
  - No significant differences in lending by scoring banks in LMI areas and elsewhere.
  - Scoring banks originated more loans (in number) in LMI areas than in moderate or high income areas.
  - Non-scoring banks originated significantly fewer loans in LMI areas than in other areas.
  - Presence or absence of a branch in a LMI area did not affect lending by scoring banks.
  - Non-scoring banks made more loans in LMI areas when they had a branch there than when they did not.

VIII. Conclusions

- Effective Scoring Of Commercial Loans Promises To Continue to Affect
  - 1. The Structure Of The Financial Service Industry
  - 2. Value Of The Traditional Banking Charter.
- Decline Of Commercial Lending Meant That Banks Had Turned To Consumer Lending, Mortgage Lending And Related Consumer Products -
  - Growth Of Securitization And Entry Of Non Bank Competitors
  - Eroded Banks' Ability To Compete And
  - Reduced Advantage Of Consumer Funded Institutions Over Market Funded Institutions
    - Finance Companies
    - Merchants
    - Brokerage Firms, Etc.

- Small And Intermediate Size Corporate Customers Were Ones Who Continued To Depend Upon Commercial Banks
  - Banks Historical Advantage
    - Servicing,
    - Credit Assessment
    - Ability To Deliver Complimentary Services, Such As Revolving Credit And Deposit Services.
- If Non Banks Can Evaluate Credits Reliably, Then Bank's Advantage In Origination And Funding These Here To For Opaque Credits Goes Away.
    - Non Bank Firms Can Originate And Underwrite
    - Funding Can Be Provided By Open Market
    - Small Business Loans Become Commodities
- There Is Little In The Way Of Credit That Remains To Banks
- Value Of Charter Is Greatly Reduced And Significance Of Regulation Burdens Visa Vis Less Regulated Firms Is Accentuated.

UNOBSERVED RISK AND THE CHOICE OF BORROWING METHOD: EVIDENCE FROM CREDIT-CARD USE BY SELF-EMPLOYED HOUSEHOLDS

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June 2000

*The views expressed in this paper are those of the author and not those of the Federal Reserve Bank of St. Louis or of the Federal Reserve System. William Bock provided research assistance.

UNOBSERVED RISK AND THE CHOICE OF BORROWING METHOD: EVIDENCE FROM CREDIT-CARD USE BY SELF-EMPLOYED HOUSEHOLDS

Credit-card lending is often portrayed as a household line of credit that can be drawn upon to bridge temporary—and presumably random—needs for liquidity (Brito and Hartley, 1995). Unlike fixed-term mortgages or installment loans, one might expect credit-card borrowing to be intermittent and unrelated to the amount of borrowing done in other forms. This characterization is not very accurate, however. There is evidence that so-called revolving credit-card balances remain positive for extended periods of time for many households. In other words, much credit-card borrowing does not appear to be temporary (i.e., for a matter of weeks or months), random, or unrelated to overall household borrowing needs.

In particular, there is a distinct life-cycle pattern of credit-card borrowing evident in household-level data: it begins when households receive credit cards in their late teens and twenties; rises steadily both in terms of the fraction of households with outstanding balances and the average amount borrowed through the thirties and forties; starts to decline as households enter their fifties; and finally fades away as households go through their sixties and seventies (Laibson, Repetto, and Tabacman, 2000). Thus, a substantial portion of credit-card borrowing resembles term loans that are associated with the purchase of a house or a durable good. Furthermore, a large fraction of households with credit cards use them to obtain credit. About 60 percent of card-holding households carried over a balance after paying their last credit-card statement in 1995, according to Laibson, Repetto, and Tabacman (2000).[1]

If lines of credit attached to credit cards appear to function much like other sources of household credit that have fixed terms, then it is reasonable to examine credit-card borrowing patterns in the context of overall household debt-structure choice (i.e., choice of borrowing method). One unique feature of credit-card borrowing is its pricing. It is easy to set up a credit-card line of credit but it is expensive to use due to double-digit interest rates for the majority of actual dollars borrowed (low "teaser" rates don't apply to most borrowings). The high interest rate is related to another important feature of credit-card borrowing, namely its unsecured nature. Furthermore, credit-card lending is typically done without face-to-face contact between the lender and borrower either before or after a loan is made. These features are all noteworthy because it is well-known that interest rates, underwriting and monitoring, covenants, and collateral are interrelated components in other forms of household borrowing and in corporate debt contracts.

Another important aspect of credit-card borrowing is that it is sometimes used for business purposes by small businesses and self-employed individuals. In the case of unincorporated small businesses and self-employed individuals, credit cards may be particularly attractive because they are easy to obtain and use and because credit-card debt is uncollateralized. Presumably, many people know that credit-card debt is often discharged completely under Chapter 7 of the personal bankruptcy code due to its uncollateralized nature and sometimes generous asset exemptions. Given the loose underwriting and monitoring standards of most credit-card lenders and pro-debtor

[1] Kennickell, Starr-McCluer, and Surette (2000, p. 23) report that 56.0 percent of households with a bank-type credit card carried over a balance in 1995, and 54.8 percent did in 1998.

treatment in bankruptcy, there is a clear incentive for small businesses and self-employed individuals—and particularly the most risky among them—to use credit cards to finance their businesses.

This paper uses household-level data from the Federal Reserve's 1998 Survey of Consumer Finances (SCF) to compare self-employed household borrowing choices to those of the entire SCF sample households. In particular, I investigate two hypotheses. First, are low-net worth households of any kind more likely to borrow with credit cards than in other forms? The unsecured nature of credit-card debt and crude risk-based pricing by lenders should appear most attractive to the riskiest households. Credit-card lenders do not know a household's net worth (or many other financial characteristics), while the SCF allows us to identify this proxy for household riskiness.

The second hypothesis asks whether low-net worth self-employed households are more likely to borrow with credit cards than are other households with similar levels of net worth. If self-employment is associated with greater default (bankruptcy) risk, then the incentive to exploit a large information asymmetry between lenders and borrowers would be even more important for self-employed households.

I find that the level of household net worth is negatively associated with credit-card borrowing among all SCF households, consistent with the first hypothesis. I find no evidence that low-net worth self-employed households use credit-card borrowings more intensively than other households, which fails to support the second hypothesis. Thus, unobserved risk characteristics such as net worth appear to be important in determining households' choice of borrowing method, but risky self-employed households do not exploit unsecured debt more than other households.

I. SELF-EMPLOYED HOUSEHOLDS IN THE 1998 SURVEY OF CONSUMER FINANCES

I classify every household that contains at least one self-employed person as a "self-employed household." The businesses operated by self-employed people constitute a subset of all small businesses. Clearly, self-employed households do not constitute a random sample of the population. This section provides information on important differences between self-employed households and the population as a whole.

TABLE 1 HERE

Table 1 provides information from the 1998 Survey of Consumer Finances comparing the 11 percent of SCF households identified as self-employed to the entire sample.[2] Self-employed households contain at least one self-employed person who was sometimes not the person identified as household head. Demographic classifications shown in the table use the household head or the household unit, whichever is appropriate.

Not surprisingly, self-employed households are more frequently in middle age than is true of the overall population. While 31 percent of households in the 1998 SCF

[2] A self-employed household is one in which either the head or the head's partner answered yes to any of the following prompts: Do you run your own business? Are you self-employed in a business owned by your primary economic unit (family)? Are you a partner in a legal, dental, medical, or other partnership? Households whose members were currently not working and did not intend to return to work were not counted as self-employed even if they answered yes to any of the above questions.

were headed by a person 30 or younger or 70 or older, only 15 percent of self-employed household heads were in these "non-prime" age groups. A larger fraction of self-employed households are married, own their own homes, are white non-hispanic, and have at least a college education than is true of the entire SCF sample.

Average and median self-employed household incomes and net worth are substantially higher than those in the overall SCF. The median self-employed household income is nearly 60 percent higher than the median household income in the SCF, while the median level of net worth is more than three times as large. Very high incomes (over $100,000) and very large levels of net worth (over $500,000) are approximately three times as likely among the self-employed as among the general population.

Given their high levels of income and net worth, it may at first appear surprising that self-employed households actually borrow somewhat more than other households. The fraction of self-employed households that have credit-card debt, housing debt, installment debt, or any other kind of debt exceeds the comparable fraction of debtholders in the general population. This pattern is probably due to the predominance of working-age people among self-employed households. It is rare for households of any kind headed by individuals 70 or older to have debt outstanding, and this group is a larger part of the overall sample than of the self-employed subsample. Very young households are not very likely to have housing debt, and many fewer self-employed households are very young than in the general population. Similarly, the fact that self-employed households are more likely to have more dollars of debt outstanding than that of the general population is related both to the age distribution and to the fact that self-employed households own larger amounts of residential and other real estate, business equity, and durable goods (all of which are typically financed, in part, with debt).

II. CREDIT—CARD BORROWING BY SELF-EMPLOYED HOUSEHOLDS

A household's personal financial affairs and its (unincorporated) business activities are legally inseparable. Thus, credit-card lending to a household with a self-employed member is tantamount to small-business lending, even if a particular credit-card purchase is made for personal rather than business reasons. The point is that the household's financial resources are fungible, so there is no legal distinction between personal and business uses of borrowings. Thus, credit-card lending to self-employed households is, in fact, a component of small-business financing.

A distinguishing feature of small-business lending is the extreme information asymmetry faced by lenders. Lenders have developed many risk-mitigating techniques over the centuries, including extensive information gathering from the applicant and from third parties in advance of making the loan, partial or full loan collateralization, loan limits, borrower equity requirements, ongoing monitoring, loan covenants, loan-amortization schedules, and many more.[3] In the case of small incorporated businesses (not part of my sample), lenders may demand a personal guarantee of the firm's debts by the owners and/or a second mortgage on the owners' houses. Monitoring the borrower after the loan is made also helps reduce moral hazard.

[3] See the Appendix for a textbook-based summary of these practices for controlling a lender's credit risks.

One often hears anecdotal evidence of a small business that is financed in part by the owners' personal lines of credit, most notably in the form of credit cards. More concretely, the Federal Reserve's 1998 Survey of Consumer Finances (1998 SCF) reveals that 50 percent of all self-employed households at the time of interview had carried over a balance after making a payment on their last credit-card statement.[4] Nine percent of self-employed households reported outstanding credit-card debt of $10,000 or more. For comparison, 45 percent of all 1998 SCF households carried over credit-card debt at the time of survey and only 5 percent had balances of $10,000 or more.

"A Debt Puzzle"

Credit-card lending is distinguished by its lack of recourse to many of the traditional lender's risk-management tools noted above (and described further in the Appendix). For example, credit-card loans are typically granted on the basis of rudimentary background information obtained through the mail or electronically, rather than face-to-face. Typical credit-card loans are not collateralized. There is no minimum borrower's equity requirement. Monitoring of the borrower's use of funds is minimal. Loan covenants are absent. Finally, repayment schedules are so lax that loans are barely self-amortizing.[5]

In addition to the unusual nature of credit-card debt from the lender's perspective, there is a growing literature that documents and attempts to rationalize what has been called "a debt puzzle" with respect to credit-card debt from the borrower's perspective (Brito and Hartley, 1995; Gross and Souleles, 1999; Laibson, Repetto, and Tabacman, 2000; Maki, 2000). Why do people borrow significant amounts of money on credit cards for extended periods of time at very high real interest rates? This does not appear rational—especially if, at the same time, a household owns fixed-interest or other liquid assets with lower yields or expected returns, or if the household has access to lower-rate borrowing sources. Many households fall into one or both of these categories.

Most theoretical attempts to explain widespread and significant credit-card borrowing focus on the transaction costs of accessing revolving credit in a form other than a credit-card loan (Brito and Hartley, 1995) and/or on the rate at which households discount their future expected consumption and income (Laibson, Repetto, and Tabacman, 2000). This paper does not address these possibilities directly.

Credit-card borrowing for business purposes may provide another piece of the answer to this puzzle. Unincorporated business borrowers can file under the personal bankruptcy rules, which contain (under the federal bankruptcy code's Chapter 7 and state law regarding exemption levels) sometimes liberal exemptions of personal assets such as home equity and retirement accounts (Berkowitz and White, 1999). Indeed, Sullivan, Warren, and Westbrook (1989) found that 20 percent of personal bankruptcies in the 1980s included debts from a failed business.

Berkowitz and White (1999) identify a statistically significant negative relationship between a state's generosity to personal bankrupts and local small

[4] This includes all self-employed households whether or not they owned a credit card; 92 percent of self-employed households had a bank-type credit card, however..

[5] A typical minimum monthly required payment is two percent of the outstanding credit-card balance, while the monthly interest rate may be one and one half percent. Thus, repayment of the principal of a loan could take many years if no more than minimum required payments are made.

businesses' access to credit. This hints at the possibility that lenders recognize that an economically significant amount of credit-card advances may, in fact, be going to small businesses. From a small businessperson's point of view, an unsecured line of credit that can be drawn down quickly and that receives favorable treatment in bankruptcy may be a bargain at an interest rate of 16 to 18 percent.

Evidence on Credit-Card Borrowing From the 1998 Survey of Consumer Finances

As shown in Table 1, the 1998 SCF indicates that 50 percent of self-employed households borrow with credit cards. Nine percent of self-employed households carried over balances of more than $10,000, and 4 percent had credit-card debt of $20,000 or more. These dollar figures are likely to underestimate actual amounts of credit-card borrowing, which in fact were approximately three times as large as the amount self-reported in the 1995 Survey of Consumer Finances (Laibson, Repetto, and Tobacman, 2000). The 1998 survey respondents are likely to have underreported their actual balances, as well. Thus, self-employed households' use of credit-card borrowing is substantial.

FIGURE 1 HERE

Figure 1 shows the percentages of self-employed households that had various levels of credit-card debt outstanding in 1998. The comparable figures for the entire SCF sample are shown, as well. Figure 1 indicates that self-employed households are somewhat less likely than the average household to be "convenience users" of credit cards—that is, to pay off credit-card charges in full each month—or to own no credit cards. Self-employed households are somewhat more likely than the average household to have large credit-card balances outstanding ($10,000 or more).

FIGURE 2 HERE

Figure 2 provides evidence on the importance of credit-card lines of credit in households' choices of borrowing method. Self-employed households are somewhat more likely than average to have low dependence on credit-card debt, defined as a ratio of credit-card debt to total debt of 0.2 or less. Given the evidence in Figure 1 of above-average dollar amounts of credit-card debt, this points to the fact that self-employed households also have more debt of other kinds than the average household, as discussed above.

Self-employed households are also less likely to have extremely high credit-card to total debt ratios, defined as 0.4 or more. What Figures 1 and 2 cannot reveal is whether there are any characteristics of individual households that are associated with high levels of credit-card debt and/or high dependence on credit-card borrowing as a source of funds. The next section turns to an examination of an important household risk characteristic that is unobservable by credit-card lenders but which might predispose some households to borrow more on an unsecured basis.

III. UNOBSERVABLE NET WORTH AND CREDIT-CARD BORROWING BY SELF-EMPLOYED HOUSEHOLDS

Borrowers know more about their chances of defaulting on a loan than lenders can ever know. This gives rise to adverse selection: riskier borrowers are more likely to apply for credit at any given interest rate. In addition, borrowers who receive credit are less motivated to repay it than lenders would like them to be, and lenders may have great

difficulty in observing borrower behavior. This is the problem of moral hazard. Both adverse selection and moral hazard arise from the information asymmetry that exists between lenders and borrowers.

Risky Debt Contains a Put Option

Fully collateralized debt or a wealthy debtor whose assets are available to creditors in bankruptcy make debt riskless from the lender's point of view. Unsecured debt or debt issued by a household or firm with few assets is risky for a lender.

A classic analysis of risky debt is as a compound security of the following type. From a lender's perspective, risky debt is equivalent to a risk-free debt obligation of the same face value, interest rate, and maturity as the actual debt obligation, *less* the value of a put option that is granted to the borrower. The put option has a strike price equal to the face amount of the debt and a maturity equal to that of the debt obligation. The state variable that determines whether the debtor will exercise the put option—that is, default on the debt—is the value of the debtor's assets available to the creditor (including collateral, if any). The larger the debtor's assets at the time the debt contract is signed, the lower the probability that the put option will be worth exercising. Conversely, a debtor with low assets will perceive the default option as relatively likely to be "in the money"—that is, worth exercising—and will be more willing to promise to pay a high interest rate. The difference or spread between the yields on a risky and a risk-free debt obligation is precisely the premium paid by the borrower for the put option granted by the lender.

Net Worth as a Predictor of Credit-Card Borrowing by Self-Employed Households

Net worth ("capital" in the five C's of creditworthiness framework discussed in the Appendix) may be an important borrower characteristic that is unobserved by credit-card lenders. Risk-based pricing cannot be perfect in the face of information asymmetry and therefore net worth may be a key determinant of a self-employed borrower's choice of financing method. Holding all else constant, a household with lower net worth should be more attracted to a credit-card loan than a high net-worth household would be because of the valuable option to default contained in risky debt. Net worth functions as a deductible on the "insurance policy" provided by bankruptcy.

Unadjusted net worth may not characterize the value of default to a borrower perfectly. Bankruptcy exemptions allow debtors to shield certain assets from creditors under Chapter 7 of the bankruptcy code. The exemption amounts differ by state, but they usually apply to assets that are critical for a debtor to rehabilitate himself or herself financially (White, 1998). For example, shelter (the "homestead exemption"), personal items such as clothes, and a car for transportation to and from work typically are granted partial or total exemption from the claims of general (unsecured) creditors, including credit-card lenders. An adjusted measure of net worth—what I call "non-exempt net worth" below—may be a better indicator of a household's propensity to take on credit-card debt than unadjusted net worth.

FIGURES 3, 4, 5, 6 HERE

Results

The results are displayed graphically in Figures 3-6. Figures 3 and 4 use the dollar amount of credit-card borrowing by households to gauge the extent of unsecured borrowing. Figures 5 and 6 use the ratio of credit-card debt to total debt to represent the importance of unsecured borrowing to households. Figures 3 and 5 use total net worth of households to proxy for their riskiness, which could also be interpreted as their incentive to borrow on an unsecured basis. Figures 4 and 6 use a simple estimate of non-exempt net worth, which is calculated as total net worth minus housing equity of up to $10,000 per household. Some states have more generous exemptions for housing equity, but the SCF does not contain state identifiers in order to protect the privacy of respondents.

All of the figures are designed to show the value of the option to default contained in credit-card debt on the vertical axis expressed as a function of a household's net worth on the horizontal axis. Any negatively sloped lines in Figures 3-6 are consistent with adverse selection in the credit-card market in the sense that households with lower net worth—those who have less to lose in bankruptcy—borrow more with credit cards. Each figure displays the average household credit-card debt or debt ratios for each of the ten deciles in both the self-employed household subsample and for the SCF as a whole (containing the self-employed subsample). That is, all self-employed households whose net worth places them at or below the level of net worth of the overall SCF sample household at the 10^{th} percentile in the net-worth distribution are assigned to the first decile, and so on. The horizontal axes are scaled by the net worth (respectively, non-exempt net worth) deciles for the entire SCF.

There is little evidence of adverse selection (negative slope) in Figure 3, in which average credit-card balances for self-employed households and for the SCF as a whole appear to be unrelated to the net worth decile in which a household is located. The results are similar in Figure 4, where housing equity of up to $10,000 is removed from the calculation of each household's net worth. Thus, my first hypothesis—that credit-card borrowing is negatively related to net worth— is not supported in these figures.

Figures 3 and 4 also show that self-employed households have more credit-card debt than the average SCF household for a given level of net worth. This would appear to support the paper's second hypothesis, that self-employed households face greater risks and therefore use unsecured credit-card debt more intensively. However, Figures 3 and 4 do not control for the fact that self-employed households have more debt of all kinds than the typical SCF household.

Figures 5 and 6 scale credit-card borrowing of each household by the total debt of the household. This ratio measures the dependence of a household on unsecured borrowing in the form of credit-card debt in the context of the household's overall choice of borrowing method. In contrast to Figures 3 and 4, Figure 5 provides clear evidence for the first hypothesis of this paper, namely, that all households except those with extremely low net worth borrow less on an unsecured basis as their net worth increases.[6] The overall negative slope of both lines in the chart indicates that privately observed riskiness

[6] Note that the households in the lowest net-worth decile may not even have credit cards, which in some sense biases the result for this group downward.

is an important determinant of the choice of borrowing method. Figure 6 uses non-exempt net worth to classify households and confirms this result from Figure 5.

The second hypothesis of this paper is that self-employed households with low net worth will borrow even more on an unsecured basis than will the average household in the SCF as a whole with the same level of net worth. In other words, business risk might compound the moral hazard associated with a low net-worth position. Figures 3 and 4 seemed to provide evidence in favor of this hypothesis, but there was no adjustment for the total level of debt each household had. Figures 5 and 6 adjust for total debt and show that there is no clear tendency for low-net worth (or any other) self-employed households to borrow more heavily with credit cards. Thus, these figures do not support the joint hypotheses that self-employed households face greater risks than other households and that self-employed low-net worth households therefore exploit underpriced credit-card debt more aggressively.

IV. CONCLUSIONS

The unincorporated businesses operated by self-employed households are a subset of all small businesses. The fact that the personal financial and business affairs of these households are legally inseparable means that self-employed households can file for bankruptcy under Chapter 7 of the personal bankruptcy code even if the source of their financial distress is business-related. Chapter 7, combined with sometimes generous state asset-exemption laws, may provide a strong incentive for self-employed households with low levels of net worth to borrow heavily on an unsecured basis. Credit-card lending is such a form or credit.

Household net worth and many other personal and financial characteristics of the household are essentially unobservable to credit-card lenders, so risk-based pricing is very crude. This information asymmetry, combined with a default put option the value of which varies inversely with net worth (a proxy for risk), creates an incentive for the riskiest households to rely more heavily on unsecured borrowing. If self-employed households encounter even greater risk than a typical household, this adverse-selection incentive is redoubled.

I use the 1998 Survey of Consumer Finances to investigate the extent to which self-employed households resort to credit-card borrowing. I find that net worth is a good predictor of the ratio of credit-card borrowing to total debt by all households but those with very low net worth. However, I find no evidence that self-employed households face greater risks than the average household. Self-employed households rely on credit-card borrowing for any given level of net worth no more than do other households.

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APPENDIX

CREDIT-CARD LENDING AND THE FIVE C'S OF CREDITWORTHINESS

Over the centuries, lenders have developed methods for limiting their exposure to credit risk. Sinkey (1998) discusses the "five C's of creditworthiness," an attempt to distill the accumulated collective wisdom of commercial lenders. Sinkey's five C's are:

- Character
- Capacity (or cash flow)
- Capital
- Collateral
- Conditions (economic).

How closely do credit-card lenders follow this loan-underwriting framework?

Commercial lenders typically interview loan applicants and require extensive financial documentation. They may also check references and, in some cases, may know the potential borrower personally. Credit-card lenders can obtain some information about a potential borrower's *character* by checking with a credit bureau. A habitual late-payer or delinquent will have black marks on his or her credit report that warn a potential lender of possible personality flaws with respect to repaying loans. The picture the credit-card lender receives is very sketchy, however, not least because the lender and borrower never meet face-to-face. Aspects of a potential borrower's character that are relevant but unobservable to the credit-card lender include the borrower's reputation, honesty, ambition, propensity to save, attitudes toward hard work, risk, or social ostracism, plans for financial success, and dozens more. The point is that a potential borrower's character remains virtually unknown to the credit-card lender.

A potential borrower's current income provides some information about his or her *capacity* to repay a loan, the second C. Some reliable information about the applicant's other credit obligations may be obtained from the credit report. A commercial lender would probe into the potential borrower's likely future income and risk of becoming further indebted, but these items remain hidden to the credit-card lender.

A potential borrower's *capital* includes his or her net worth, that is, the financial and non-financial assets he or she owns minus the debts owed. A commercial lender would demand a fairly detailed balance sheet detailing the potential borrower's assets and liabilities. This critical component in a business lender's decision whether to grant a loan to a business borrower is missing from the credit-card lender's information set, however. In addition to the lack of information itself, the fact that the borrower knows his or her own net worth and knows that the potential lender does *not* know creates a classic adverse-selection (or "lemons") problem.

Perhaps even more important than capital to a conventional lender is *collateral*. This is a legally enforceable right of the borrower to seize assets if the borrower fails to make required cash payments. Remarkably, credit-card lenders obtain no collateral when they lend. From a business borrower's perspective, the absence of capital and collateral requirements may compensate for a high stated interest rate on a loan. That is, the credit-card borrower puts no assets at risk when drawing down a credit-card line of credit.

Finally, economic *conditions* are important for a potential lender to consider. Macroeconomic conditions such as interest rates and the level of national business activity may be observed as easily by a credit-card lender as by a commercial lender. However, local economic conditions that may be just as important for a borrower's creditworthiness are not easy for a nationwide lender to observe.

The inevitable conclusion one must draw from this brief discussion is that credit-card lenders do not operate like commercial lenders. They know very little about their potential borrowers, they impose no restrictions on the use of funds, and their legal rights to repayment or seizure of collateral or other assets are flimsy. It is at least conceivable that some small-business borrowers, including some self-employed households, exploit the extreme information asymmetry present in the credit-card lending market to obtain credit on more favorable terms than they could otherwise obtain if all five C's were used by the lender.

TABLES AND FIGURES

TABLE 1

SELF-EMPLOYED HOUSEHOLDS IN THE 1998 SURVEY OF CONSUMER FINANCES

	Self-employed households	Entire 1998 SCF
Demographic characteristics		
Fraction of households in the 1998 SCF	11%	100%
Fraction of household heads 30 years old or younger	7%	15%
Fraction of household heads 70 years old or older	8%	16%
Fraction of household heads 31-69 years old	85%	69%
Fraction of married households	74%	52%
Fraction of households that own their homes	75%	58%
Fraction of household heads that are white non-hispanic	88%	78%
Fraction of household heads with at least a college degree	44%	33%
Household income		
Household income $10,000 or less	5%	14%
Median household income	$52,000	$33,000
Household income $100,000 or more	23%	9%
Household net worth		
Household net worth $10,000 or less	10%	25%
Median household net worth	$226,000	$71,700
Household net worth $500,000 or more	30%	10%
Household non-exempt net worth* $10,000 or less	11%	27%
Median household non-exempt net worth*	$216,470	$63,450
Household non-exempt net worth* $500,000 or more	30%	10%

TABLE 1, CONTINUED

SELF-EMPLOYED HOUSEHOLDS IN THE 1998 SURVEY OF CONSUMER FINANCES

	Self-employed households	Entire 1998 SCF
Debt holdings		
Fraction of households with debt of any type	86%	86%
Fraction of households with credit-card debt	50%	45%
Fraction of households with housing debt	65%	64%
Fraction of households with installment debt	48%	44%
Fraction of households with other debt	12%	9%
Credit-card debt		
Fraction of households with a bank-type credit card	80%	68%
Fraction of households with credit-card debt of $1,000 or more	34%	29%
Fraction of households with credit-card debt of $10,000 or more	9%	5%
Fraction of households with credit-card debt to total debt ratio of 0.1 or more	22%	27%
Fraction of households with credit-card debt to total debt ratio of 0.4 or more	10%	15%
Housing debt		
Fraction of households with housing debt of $50,000 or more	42%	26%
Fraction of households with housing debt of $200,000 or more	9%	4%
Installment debt		
Fraction of households with installment debt of $1,000 or more	44%	39%
Fraction of households with installment debt of $30,000 or more	8%	5%

* Non-exempt net worth is defined as net worth minus housing equity up to $10,000 per household.

Sources: 1998 Survey of Consumer Finances and Kennickell, Starr-McCluer, and Surette (2000).

FIGURE 1: CREDIT-CARD BALANCES

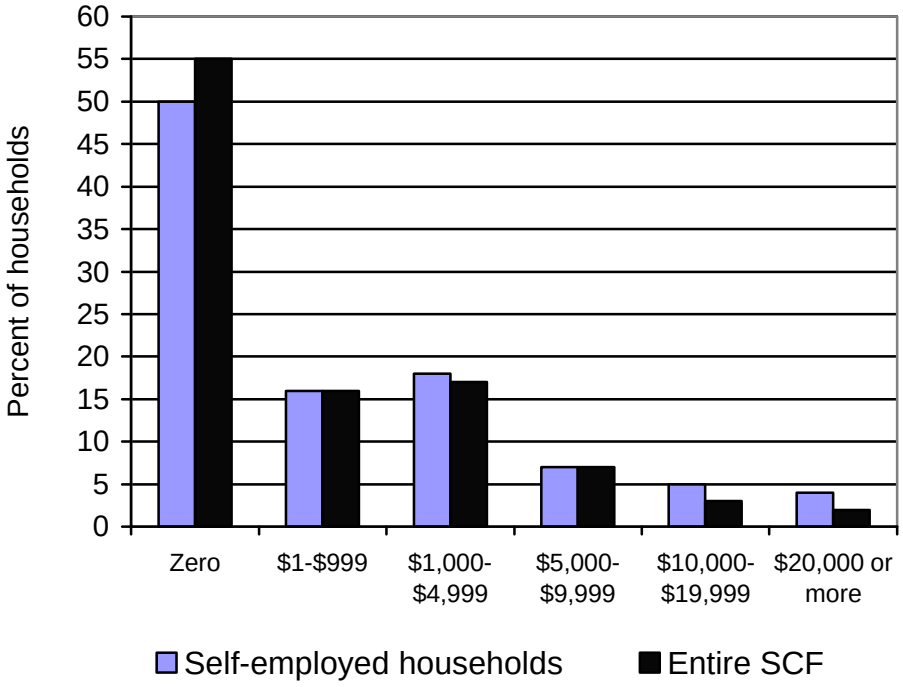


FIGURE 2: RATIO OF CREDIT-CARD BALANCES TO TOTAL DEBT

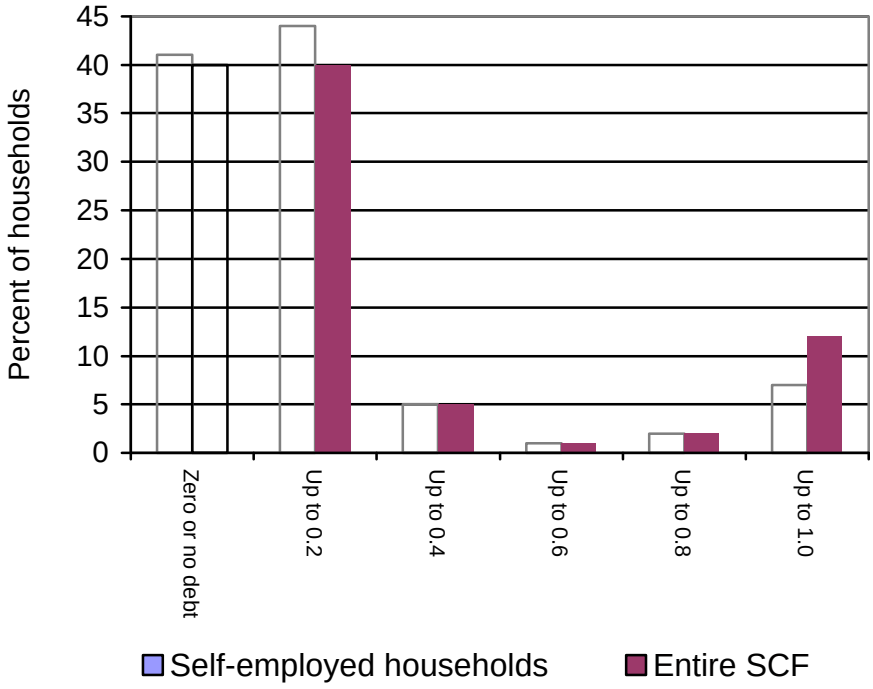


FIGURE 3

CREDIT-CARD BALANCES CONDITIONED ON NET WORTH DECILES FROM 1998 SURVEY OF CONSUMER FINANCES

FIGURE 4

CREDIT-CARD BALANCES CONDITIONED ON NON-EXEMPT NET WORTH* DECILES FROM 1998 SURVEY OF CONSUMER FINANCES

* Non-exempt net worth is defined as net worth minus housing equity up to $10,000.

FIGURE 5

RATIO OF CREDIT-CARD BALANCES TO TOTAL DEBT CONDITIONED ON NET WORTH DECILES FROM 1998 SURVEY OF CONSUMER FINANCES

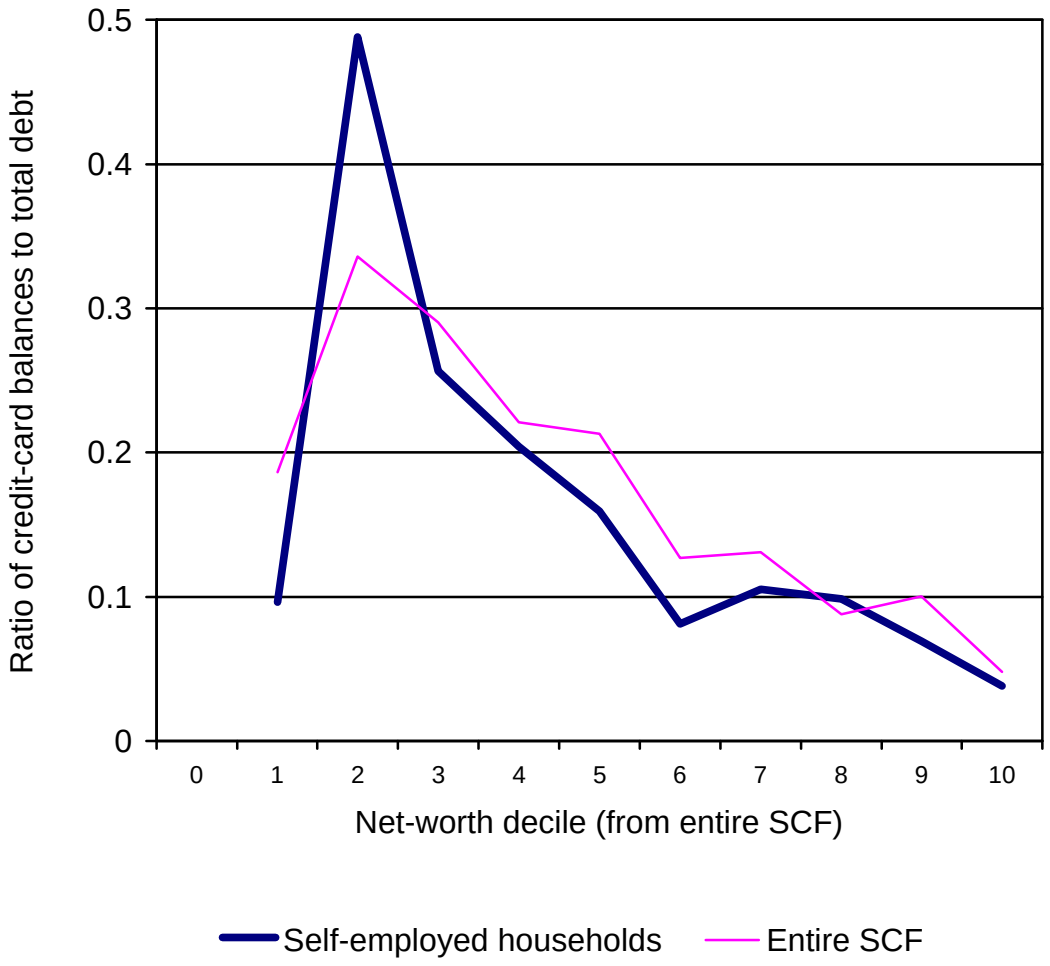
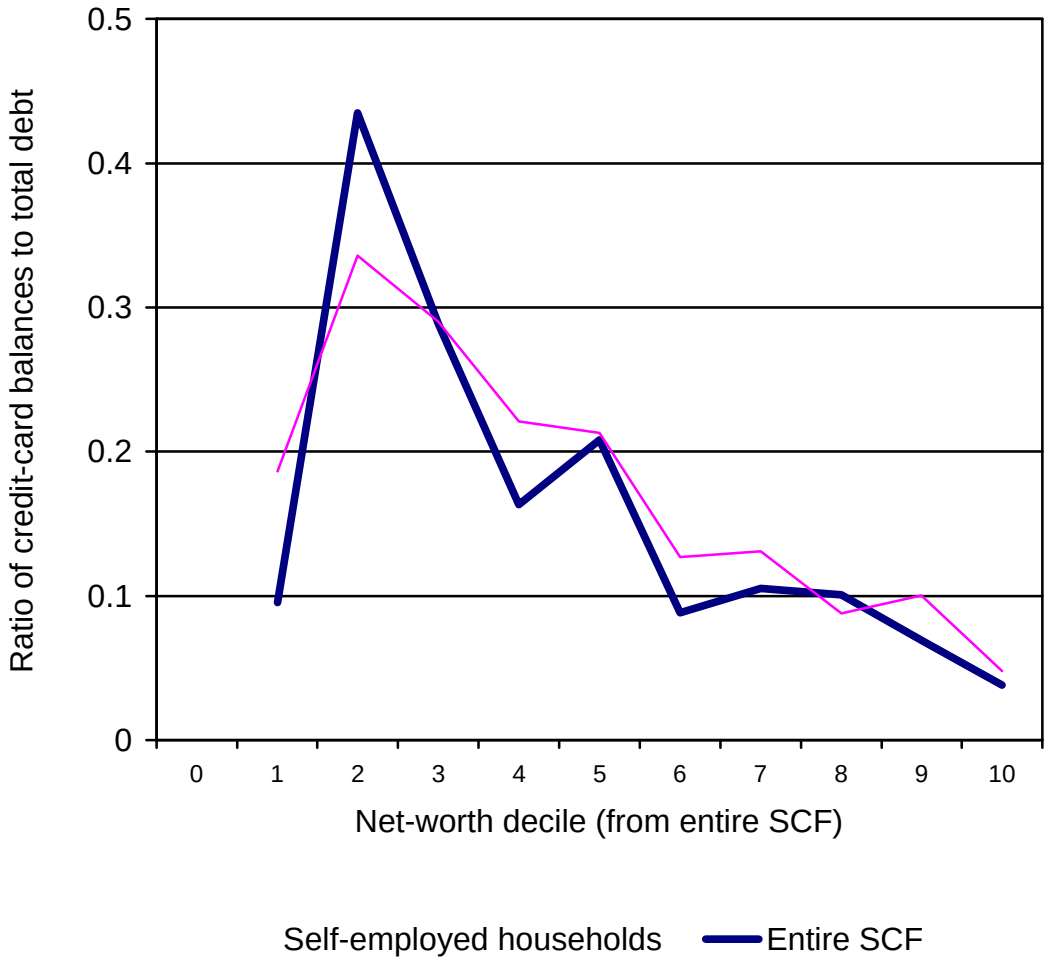


FIGURE 6

RATIO OF CREDIT-CARD BALANCES TO TOTAL DEBT CONDITIONED ON NON-EXEMPT NET WORTH* DECILES FROM 1998 SURVEY OF CONSUMER FINANCES



* Non-exempt net worth is defined as net worth minus housing equity up to $10,000.

Concluding Session: Are There Needed Policy Actions?

Comments of Thomas Hall, Milken Institute

First of all, let me thank the conference organizers—Bob Berney and his colleagues at the Office of Advocacy of the Small Business Administration—and the other sponsor, the National Commission on Entrepreneurship headed by Patrick van Bergen. The session was very interesting and some progress on the understanding of a very important topic was made.

Purpose of the Meeting

Before summing up, I think we should keep in mind the reasons for the meeting. Rep. John LaFalce spoke of the importance of viewing policy not from its effect on the macroeconomy as a whole but on its relationship with individuals, and I might add, especially individuals who may for one reason or another be excluded from the opportunities many take for granted. Small business access to capital markets is key in this context. Jere Glover added that small businesses, in particular, need and use credit as opposed to equity as a form of external finance. Moreover, Rep. Jim Leach reminded us that within recent memory, small businesses have created more jobs than Fortune 500 firms have. We are here today in order to examine the link between policy and research, and how research can aid the policy process especially regarding how the changing nature of the financial services industry will affect small business access to capital.

Relationship Between Policy and Research

Interestingly, the relationship between policy and research contains lags and nonlinearities. Research progresses more or less linearly, with a growing number of papers written each year. (Of course, we may need adjustments to control for the availability of data, hedonistic allowances for the quality of research, etc.) However, policy reform progresses in a mostly non-linear fashion, as was evidenced last year with the passage of Gramm-Leach-Bliley that essentially repealed the Glass-Steagall restrictions facing the financial services industry. This was a major jump in the regulatory environment. Presently, data availability and research are in the phase of catching up to this recent surge in policy reform, so any objective jury will be out on that particular piece of legislation for quite some time. Indeed, given the lag between actions and data, we are only now examining activity from the early to mid 1990s.

Effect on Small Businesses of Merger and Acquisition Activity

With this mismatch between policy and research in mind, let me now focus on a few of the more important substantive issues of the meetings. First, let's look at the extensive amount of mergers and acquisitions (M&A) taking place in the financial services industry. In 1989 there were 11,000 banks, and there have been 10,000 mergers. Basically, however, the lesson from the research on this topic can be boiled down to the fact that the various regulators (here represented by Robert Kramer) are doing their job, in that this activity has not translated into a noncompetitive market. And, there is much new entry: despite this M&A activity, we still have 5,000 banks in the year 2000. Indeed, the research presented here today shows that the end statistical effect of market power is not that evident—but there might be an effect on minority, rural, and women-owned businesses which may need to be addressed with further research. William Dunkelberg and Jonathan Scott used survey data to address whether there has been a loss of service, finding that there has been some (this of course is balanced by the 24-hour access afforded by internet banking addressed by Dan Nolle). Robert Avery and Katherine Samolyk noted the effects on rural areas: loans tend to decrease after mergers. Alan Berger spoke on the "external effect" (the effect of local banks moving in after one local institution has been acquired) which mitigates the market power of the acquiring bank. And, the industry will probably continue to be competitive as long as it remains a hotbed of innovation. For example, credit scoring, as Mary Thorpe mentioned, facilitates a "broader window"—to the extent that more people will be able to fill out "color-blind" standardized loan applications, this will

serve to in some ways alleviate the credit gap regarding minority (examined by Ken Cavalluzzo), rural (examined by Bob Berney and Charles Ou and discussed by Robert Collander), and women-owned businesses.

The Internet and the New Economy

Larry White spoke of Berger and Udell's finance continuum between—at the left end—close, personal relationships between bankers and small businesses that are prevalent, say, in small towns, and—at the right end—the impersonal nature of computerized capital markets transactions exemplified by deep and liquid international markets for currency, bonds, and equities. Accordingly, he felt that the internet will serve to shift the spectrum, meaning that more and more transactions will be able to take place in the impersonal realm of electronic transfers. Hence, smaller banks (some of which it should be remembered are small businesses too) that specialize in personal relationships will be under pressure unless they can squeeze profitability out of their special community knowledge. There are, of course, natural limits to how far the spectrum can shift—the digital divide applies to small borrowers, for example, and will mean some people don't have access to even the most accessible on-line loan applications. In this dimension, Ann Grochala adds that limits exist to how far the spectrum can shift. The idea of "smart-bots" for comparison-shopping of various loan terms will certainly allow small business people to maximize their options and will serve to keep market competitive. Research presented by Dan Nolle found that non-internet firms give more loans if they have a branch physically located in the area; this implies an area of the old economy that will linger for quite some time in all likelihood, however.

How to Encourage Credit to Small Business

Another substantive topic that received attention especially in the discussion concerned the need to promote credit to small businesses. Should we enact subsidies, and if so, what form should they take? During discussion, Bill Lang brought to our attention the possibility of market failure and, subsequently, asked if there is then a need for more government action. In general, many economists feel that before we go to subsidies, we should consider carefully their implications and explore other options as well:

- Are there any remaining regulatory blockages that hinder the flow of capital to small business? For instance, can large financial service firms hold securitized packages of small business loans—and if so are they properly placed in the regulatory risk spectrum (i.e., in which risk tranche are such holdings permitted)? If large-scale securitization of small business loans is to occur, how will the moral hazard issue (i.e., the only firms that apply for loans are those which were bad enough to be shout out of the traditional bank loan process) be overcome?
- Rep. Leach noted that with the enaction of Gramm-Leach-Bliley, there is likely to be more secondary market activity for small business loans. He noted, however, that Farmer Mac provides an example of how not to stimulate a secondary market, and pointed to that experience as something to avoid.
- Are there any lessons for small business loan securitization that we could learn by examination of what made the secondary mortgage market possible and successful?

Before advocating subsidies, we need to have a better handle on these questions.

Progression Analysis: Looking Forward

Much of the research presented at the conference made use of regression analysis of historical data. Let me now turn to progression or forward-looking analysis, in an effort to assess the direction of the effect of changes in the financial services industry on small business. The growing international nature of capital markets was not covered in the proceedings, and although the U.S. has in many ways the most sophisticated markets in the world, there will be at least some effect from the internationalization of the financial services industry. Diana Hancock spoke about the effect of the earlier credit crunch on small business. In particular, she noted the increase of problems at small banks. This may repeat itself if a credit crunch were to occur again in the near future. There has been more M & A, but the effect of this is yet unclear, and more research is needed to determine its effect on, especially, women, rural, and minority

businesses. Finally, in the wake of upheavals being brought about by the enactment of Gramm-Leach-Bliley, there will be room for more research in order to determine the effect on small business access to capital. It may well be ten or twenty years until we can with confidence answer questions concerning the effect of recent regulatory and policy changes on the financing of small business.

The Changing Banking Structure
and its Impact on Small Business

June 15, 2000
Rayburn House Office Building,
Room 2220
3:45 PM

The “Credit Crunch” and the Availability of Credit to Small Business

Diana Hancock

Board of Governors of the Federal Reserve System

James A. Wilcox

Office of the Comptroller of the Currency

The “Credit Crunch” and the Availability of Credit to Small Business

- Issues
- Previous Research
- Data
- Econometric Specification
- Findings
- Conclusions

Issues

- Was Bank Lending Affected by Capital?
  - Were smaller banks more affected?
  - Did capital pressures in one group of banks affect banks of a different size?
- Did Banks' Troubles Affect Real Activity?
  - Were small businesses affected more or less than large businesses by banks' troubles?
  - Were small businesses affected particularly by small bank troubles?
  - Did activity in "large" small businesses respond more than activity in the smallest and largest businesses?
- Was the SBA a Shock Absorber?

Previous Research

- Bank Loans and the Credit Crunch
  - Berger and Udell
  - Hancock and Wilcox
  - Peek and Rosengren
- Bank M&A's and Small Business Loans
  - Berger, et al.
- Real Activity and the Credit Crunch
  - Bernanke and Lown
  - Hancock and Wilcox
  - Peek and Rosengren

Data

- 1989-1992, Annual, by State
- Bank Data from Call Reports
  - Loans
    - Total, C&I, Commercial Real Estate, Consumer
  - Equity Capital
  - Loan Delinquency Rates
- Macroeconomic Data
  - Index of Consumer Sentiment
  - Nominal Prime Interest Rate
  - Gross State Product
- Small Business Activity
  - Employment, Number of Firms, Payroll (by Size of Firm)
  - Business Failures and Bankruptcies
- SBA Loan Guaranty Data

Econometric Specification

- Real per capita
- Dependent Variables
  - First-differences Remove State-Specific Effects
- Explanatory Variables
  - First-Differences of Equity Capital
    - Small Banks
    - Large Banks
    - 1989-1990 Period
    - 1991-1992 Period
- More Explanatory Variables
  - Index of Consumer Sentiment (lagged 1 yr)
  - Nominal Prime Interest Rate
  - Delinquency Rates (%)
    - C&I Loans
    - Real Estate Loans
- Estimation Procedure
  - Two-stage Least Squares

Findings

- Bank Capital Affected Loans
  - Loan Portfolios at Small Banks Shrank More than Those at Large Banks in Response to Declines in Bank Capital
  - Larger Effects in 1989-1990 Period
  - Large Banks' Loans Affected by Small Banks' Capital Declines
- Loans Were Also Affected By:
  - Loan Delinquencies
  - Consumer Sentiment
  - Prime Interest Rate

Findings

- Real Activity Declined With Bank Capital
  - Gross State Product Affected
  - Employment, Firms, and Payrolls Affected
  - Firms of All Sizes Affected
  - Small-Firm Responses Were Typically Larger
  - Small-Bank Effects Were Larger

Findings

- Small Business Administration Loans
  - Rose with Lower Interest Rates
  - Rose with Higher Consumer Sentiment
- Business Failures
  - Rose with Higher Real-Estate-Loan Delinquency Rates
  - Rose with Higher Interest Rates
  - Rose with Lower Consumer Sentiment

Conclusions

- Capital Effects on Bank Loans
  - Bigger Effect at Small Banks than Large Banks
  - Small-bank Capital Declines Raised Large-Bank Lending
- Capital Effects on Real Activity
  - Small Firms Responded More
  - Losses at Small Banks More Powerful
- “High-Powered” Loans
  - Made by Small Banks
  - Made to Small Firms

Discussion Notes for Hancock/Wilcox paper on "The Credit Crunch and the Availability of Credit to Small Business"

For U.S. Small Business Administration Conference on "The Changing Banking Structure and Its Impact on Small Business"

William Lang
Office of the Comptroller of the Currency
June 15

Three Main Findings of the Hancock/Wilcox Paper

The authors use lagged bank capital to identify a "supply" factor for bank lending that is independent of loan demand. They find:

(1) Bank loan "supply" conditions (availability of capital) has a significant and sizeable impact on macroeconomic variables. Thus banks are at least "special" in that there doesn't seem to be a perfect substitute for bank credit that is available to borrowers. These results are similar to the findings by Peek and Rosengren (1995).

(2) Lending at small banks declines more for a given fall in bank capital. This finding is similar to that in Kashyap and Stein (1995).

(3) The dollar for dollar impact on the macroeconomy from a decline in bank lending was much larger for small banks. I am unaware of any similar result in the literature.

Finding (1) is consistent with much theoretical and empirical work which has stressed that bank relationships create quasi-rents for the bank and borrower because of the accumulated "private" information of the bank.. These rents are greatest for "informationally obscure" borrowers and size of business is a reasonable though imperfect proxy for such borrowers.

Kashyap/Stein (1995) obtain the same result as (2) and they hypothesize that banks (just like businesses) face external financing constraints, and these constraints are more binding on smaller banks. Simply put, small banks find it more expensive to raise non-deposit funds, and this cost wedge between

small bank and large bank financing is pro-cyclical, and should be negatively associated with the banks capital position.

An alternative hypothesis for (2) could explain the same results. Since small banks specialize in loans to "high risk or informationally intensive" borrowers, a decline in capital that threatens the health of the institution and produces a "flight to quality" (Lang and Nakamura (1993) would have a greater impact on small banks.

Finding (3) is perhaps the most unique and provocative finding of the Hancock/Wilcox paper. This finding suggests that small banks are issuing "high-powered" loans that are in some sense "more productive". This is consistent with the view that small banks may allocate capital more efficiently to small and informationally obscure borrowers than larger banks.

Questions underlying the research on banks and small business finance?

To put the findings of Hancock/Wilcox into proper context, it is useful to clarify the basic underlying issues that has motivated the great amount of research on credit and the macroeconomy over the last 20 years. This research has attacked the following central questions:

I. Does finance matter for investment decisions and does this matter for the supply of credit to small businesses?

II. If finance matters, are the imperfections in the capital markets an example of a "market failure" or is the allocation of finance a "constrained optimal equilibrium"?

III. Do the imperfections in the capital markets have macroeconomic significance? Is this credit channel and (in particular bank credit) an important component of monetary policy and why?

IV. Does the structure of financial institutions matter for economic performance? Are banks special and why? Are small banks different from large banks and why?

V. What issues are raised by the changing structure of the banking system?

I. Does Finance Matter for Investment Decisions?

Perhaps surprisingly, the standard text book theory of investment decisions said no.

Adam Smith's invisible hand was much like the spiritual voice in the movie *Field of Dreams* who said "If you build it they will come". In the case of business investment the they refers to external financiers, and an important added clause is that the returns to the investment must exceed the economy's required rate of return on capital. However, any project meeting that criteria would be funded. Source of financing (internal or external) was irrelevant.

New Credit theory: Uncertainty and asymmetric information creates a wedge between "external" and "internal" finance. This hypothesis (Joe Stiglitz deserves the most credit for the underpinnings of this theory) says that financing doesn't necessarily go to the most productive investments because in some cases it is either impossible or highly costly to determine the return on the project.

What does research tell us? A significant amount of research now exists showing that this wedge exists and significantly affects the allocation of capital at individual firms. The first empirical paper that really got the ball rolling was the Fazzari, Petersen and Hubbard (1988) paper "Financing Constraints and Corporate Investment". This paper demonstrated that investment decisions were tied to cash flow and that this link was most significant for firms with higher costs of information (small is typically used as a proxy). There are now a very large volume of papers confirming this finding.

II. Is the wedge between external and internal finance an example of a "market failure" or is the allocation of finance a "constrained optimal equilibrium"?

The existence of a wedge between the cost of internal and external finance is a capital market *imperfection* but not necessarily a capital market *failure*. It is possible that the competitive equilibrium is a *constrained pareto optimum*. That is, given the information structure, a social planner might be unable to attain a pareto superior outcome. The existence of a wedge tells us that "endowments matter" and thus might raise questions of social equity, but it doesn't necessarily mean that we could do better from an efficiency standpoint.

Theoretically, Stiglitz and others have shown that moral hazard/asymmetric problems can produce market failures - outcomes that are not constrained optimums. However, empirically there is no clear evidence one way or the other.

The papers finding that small banks make high-powered loans does lend some support to the notion that system design matters and can improve the efficiency of capital allocation.

III. Do the imperfections in the capital markets have macroeconomic significance? Is this credit channel and (in particular bank credit) an important component of monetary policy and why?

Early Theoretical Papers:

Bernanke and Gertler (1989) - agency costs, net worth and the macroeconomy. Lang and Nakamura (1989, 1990) - dynamic information externalities and the credit cycle.

A common theme in these papers is that there is an endogenous business cycle aspect to the asymmetric information problem in credit markets. The easiest way (at least for an economist) to think about this is to look at the credit process as a production process with produced and non-produced inputs. A crucial produced input is the informationed that is gathered and assessed in the process of deciding to extend and price credit.

Bernanke/Gertler (following Irving Fisher) point to net worth as an input that can "substitute" for costly efforts to obtain information and monitor activities (think about bank capital rules). Pro-cyclical net worth leads to an exacerbation of shocks to the economy.

Lang/Nakamura (following Schumpeter) point to the information produced by the market place as a substitute input for costly private information gathering. Part of entrepreneurial activity is the creation of new markets and new products. The quality of information produced by the market is procyclical, particularly in thin markets. Example: the quality of estimates from real estate appraisals depends on the level of sales activity in the local market. If information cannot be privately captured by the lender, then there is less incentive to lend to a risky entrepreneur. In other words, the private discount rate for risk taking by lenders is higher than the social discount rate. Financial Intermediaries can mitigate these risks through "relationship lending". Such lending creates private information that is not easily obtained by a third party. This proposition also provides a theoretical basis for such policy proposals as enterprise zones. It also may explain why creditor is less competitive markets may be willing to take on riskier lending [Petersen and Rajan (199)]

A Few of the Early Empirical Papers:

Bernanke, Gertler and Gilchrist (1996) paper "The Financial Accelerator and the Flight to Quality" is an excellent paper on this subject that also provides a good reference for much of the literature on this subject. There were two kinds of early empirical papers addressing the macroeconomic significance of the new credit view:

1. The cyclical responses of small or informationally intensive businesses to monetary contractions?

Oliner/Rudebusch (1995) and Gertler/Gilchrist (1994) - Show that small firm borrowing and small firm real activity react more quickly and more intensely to monetary shocks relative to larger firms.

2. The cyclical responses of small or informationally intensive businesses to monetary contractions?

Lang and Nakamura (1995) , and Morgan (1994) show that loans to relatively information intensive borrowers are more sensitive to monetary contractions.

These papers used data on bank loans but did not attempt to find out if "bank lending" was special..

IV. Does the structure of financial institutions matter for economic performance? Are banks special and why? How important are relationships in the lending decision? Are small banks different from large banks and why?

Banks "Specialness": Peek and Rosengren (1996) and Hancock and Wilcox (1998) show that shocks to the supply of bank loans (capital, health of banks - supervisory ratings) have macro impact. In other words, there aren't perfect substitutes for bank credit.

Why might banks be "special" relative to other intermediaries?

Not much theoretical or empirical work on this. Nakamura (1993) hypothesized that bank specialness was due to access to checking account information. A recent paper by Mester, Nakamura and Renault (1998) provides some empirical confirmation to this hypothesis.

Role of Relationship Lending: Petersen and Rajan (1994), Berger and Udell (1995) point to the importance of relationship lending.

Does bank size matter?

Are smaller banks better or more willing to at making loans to large banks duplicate it if it is profitable? The empirical work by Berger, Kashyap and Scalise (1995) and Cole, Goldberg, White (1999) seem to be answering this question affirmatively, but the jury is still out.

If relationship lending is profitable, why don't large banks do it?

Not a great deal of theory on organizational form and outcomes. Stiglitz has done some work on this that argues that large organizations have incentives for creating hierarchies that make it more difficult to base decisions on less formal information sources.

V. What issues are raised by the changing structure of the banking system?

Will consolidation reduce the importance of relationship lending?

Are bank's losing their "specialness"? Will technology enable non-banks to acquire the same information and develop the same types of relationships as banks?

What will be the overall impact of financial deepening (credit scoring, securitization, etc.) on the efficient allocation of capital and the riskiness of small and large banks?

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CURRENCY

Committee on Banking and Financial Services

James A. Leach, Chairman

For Immediate Release:
Thursday, June 15, 2000

Contact: David Runkel or
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Remarks*
Of Rep. James A. Leach
Chairman, House Banking and Financial Services Committee
Before U.S. Small Business Administration Symposium
On the Changing Banking Structure and Its Impact on Small Business
Washington, D.C.
June 15, 2000

First a note about the basics. In consideration of banking legislation, the issue before Congress should never principally be what is best for a particular financial institution or the financial services industry, but what is in the best economic interest of the country. This can generally be defined as what is in the best interest of users of financial products and competition in general.

Hence, in enacting sweeping bank reform legislation last year, the Gramm-Leach-Bliley Act, the goal was to upend barriers to competition in product delivery. It is no accident that the Treasury Department concluded that because of the pro-competitive elements of the legislation consumers will save approximately $18 billion per year.

With exceptions, studies indicate that large institutions tend to serve larger businesses, while smaller banks primarily lend to small businesses. This is why in formulating the recently enacted financial services modernization bill, it was important to ensure that community institutions were empowered to meet the credit needs of middle-class citizens and small-and-medium-sized businesses, and pockets of America not be deprived access to credit.

Historically, issues that related to overturning Glass-Steagall constrictions on competition have been considered principally competitive challenges between our largest commercial banks and their investment bank rivals. But the approach taken in the G-L-B Act takes strongly into consideration, and in some ways tilts, to the peculiar problems of our smaller community institutions and the customers they serve.

Five areas deserve particular mention:

1. Unitary Thrifts. While the financial modernization legislation provides for increased competition in the delivery of financial products, it repudiates the Japanese industrial model and forestalls trends toward mixing commerce and banking. The unitary thrift loophole that allowed commercial firms to control S&L charters has been closed. Not only will no new unitaries be chartered, but those in existence cannot be sold to commercial firms. This means that the signal breach of banking and commerce that existed in prior law is plugged, which has the effect of both stopping the potential "keiretzuing" of the American economy and protecting the viability, and therefore the value, of community bank charters. As close observers of the process understand, at many stages in consideration of bank modernization legislation, powerful interest groups attempted to introduce legislative language which would have allowed large banks to merge with large industrial concerns – i.e., to provide that Chase could merge with General Motors or Bank of America with Amoco. Instead, the G-L-B Act precluded this prospect and, indeed, blocked America's largest retail company from owning a federally insured institution, for which an application was pending.

2. Federal Home Loan Bank System Reforms. The FHLB charter is broadened to allow community banks to borrow for small business and family farm lending. The implications of this FHLB mission expansion are extraordinary. In rural areas it allows, for the first time, community banks to have access to long-term capital comparable to the Farm Credit System, which like the Federal Home Loan Bank System, is empowered as a Government-Sponsored Enterprise to tap national credit markets at near Treasury rates. The bill thus creates greater competitive equity between community banks and the Farm Credit System, and the potential of greater credit cost savings for farmers. With regard to the small business provision, the same principle applies. If larger financial institutions choose to emphasize relationships with larger corporate and individual customers, the ability of community banks to pledge small business loans as collateral for FHLB System advances will allow them to serve comprehensively a small business and middle class family market niche. Most importantly, if the present trend continues of American savers putting less money in banks and more in non-insured deposit accounts, such as money-market mutual funds, this FHLB reform assures community banks the liquidity -- at competitive costs -- they will need for generations to come. Indeed, the secondary market mechanism established for small business loans under the G-L-B Act may prove in the long run to be the most important small business legislation since the establishment of the Small Business Administration (which, by the way, I consider to be the most successful and under-appreciated of all government program agencies).

3. Additional Powers. In recent years, sophisticated money-center banks have developed powers, under Federal Reserve and OCC rulings, that have allowed them to offer products which community banks in many states were frequently precluded from offering. G-L-B allows community banks all the powers as a matter of right that larger institutions have accumulated on an ad hoc basis. In many areas of the country, small and medium sized businesses only have a financial relationship with a community bank. By empowering community banks, modest sized businesses will gain access to securities and other product offerings that they have not been provided before.

4. Prohibition on Deposit Production Offices. The legislation expands the

prohibition on deposit production offices contained in the Reigle-Neal Interstate bill to include all branches of an out-of-state bank holding company. This prohibition ensures that large multi-state bank holding companies do not take deposits from communities without making loans within them.

5. <u>Competition</u>. The powers under the act will provide smaller banks with a local community orientation a credible basis to compete with financial institutions of any size or any specialty and in addition to offer, in similar ways, services that new entrants into financial markets, such as Internet or computer software companies, may originate.

A focus of this symposium has been on how bank mergers affect credit to small businesses. Nothing in the G-L-B Act liberalized the 1994 Riegle-Neal Interstate Banking and Branching Efficiency Act that provided for interstate banking and branching. Interestingly, what we have witnessed in many communities where mergers – generally driven by estate planning considerations -- have occurred, is (1) that many customers have transferred accounts to remaining locally-owned and controlled institutions and (2) that new locally run financial institutions have been chartered.

There is a dual dynamic in banking today. The big are getting bigger from the top down through mergers, but the small are expanding market share from the bottom up.

Many of the greatest challenges facing small businesses and community financial institutions come from technological advances, which, because of the cost of innovation, larger institutions often lead. But once introduced, technological innovation moves swiftly throughout the industry.

In the future those institutions that are best poised to succeed are those that adapt to new technologies and those that have close personal ties with their customers. The competitive position of community institutions in this market circumstance is quite strong. It is simply far easier for smaller institutions to make technological changes than it is for larger institutions to create the same kind of customer relations that hallmark most smaller banks.

There is one other aspect of the G-L-B Act that I would like to highlight with regard to lending. Included in the legislation is a special section which establishes a new federal microenterprise program to provide grants for technical assistance for microenterprise lending organizations.

America is an entrepreneurial society, and it is in this entrepreneurial spirit that the concept of microlending has been embraced by many as an avenue for opportunity for low income Americans who otherwise would have difficulty obtaining credit. In a free market economy, it is critical that the entrepreneurial spirit be nourished and that access to capital, which is an essential ingredient to entrepreneurial activity, be provided to all parts of society. If entrepreneurial dreams are denied any part of America, society as a whole is short-changed.

G-L-B authorizes a microenterprise technical assistance and capacity building grant program. Program for Investment in Microenterprise (PRIME) Act funds are authorized to be used to provide training and technical assistance to low income, disadvantaged entrepreneurs interested in starting or expanding their own businesses.

Microenterprise is defined differently in different societies in different times. Today in America microenterprise is generally considered to be a sole proprietorship that has fewer than five

employees, has difficulty getting access to credit from commercial banks and requires a loan in an amount under $15,000. Just as other parts of the world have borrowed in recent years from the American experience, it is appropriate that we learn from the experiences of others. The Grameen Bank model is one of decentralized, individual empowerment. It fits aspects of the American economy just as it does aspects of Bangladesh.

Despite the economic boom the country is experiencing, prosperity is not universal. Job opportunitiy is as strong as at any time in the last half century, but the gap between the "haves" and "have nots" is widening. For years, it has been evident that when functional literacy has been at issue, good wage opportunity is limited. Now the divide is growing where enumeracy is the problem. The new economy rewards the mathematically functional. In this setting the Committee is obligated to look at the types of self-help initiatives that involve credit assistance for individiuals and areas of our economy in which opportunity is lacking.

Hence, in addition to the microenterprise aspect of G-L-B, the financial modernization approach taken ensures that the Community Reinvestment Act is kept in place so that low-and-moderate-income neighborhoods across the country will not be deprived credit.

In other action, the Committee has approved Community Development Financial Institution (CDFI) legislation to facilitate private-public partnerships for promoting economic revitalization and community development at the local level.

In addition, the Committee recently approved legislation to establish the American Private Investment Companies (APIC) program to increase private job-creation investments in communities with high unemployment rates.

The legislation would create a number of companies licensed by HUD as for-profit private venture capital firms and provide government guarantees of company debentures, provided that the licensee brings at least $25 million in private equity capital and substantially serves low-income distressed neighborhoods and communities.

And, earlier this year, the House approved legislation aimed at increasing home ownership, including special provisions to help an estimated 125,000 school teachers, police officers, firefighters, municipal employees, corrections officers and persons with disabilities buy homes at discounted rates over the next five years.

Finally, the Committee has the most important oversight responsibility of Congress – that over the Federal Reserve's conduct of monetary policy. The state of the economy, especially as it relates to small business, is reflective of the macro-economic setting that is so significantly shaped by Federal Reserve policy.

The 1913 Act that created the Federal Reserve System represents the most important institutional addition to the American system of governance since the adoption of the Constitution. Recognizing that it lacked the sophisticated skills necessary for bank supervision and monetary policy control, the Congress established an independent Federal Reserve as a quasi fourth branch of government. Today because of the strength of the economy and the weakness of the political comity between the legislative and executive branches, the Fed enjoys unprecedented worldwide respect. Alan Greenspan stands on the back of Silicon Valley as he presides over the most stable institution in Washington and fine tunes policies that not only seem more coherent than legislative and executive branch pronouncements but more civilly and rationally derived.

I stress Silicon Valley because as Chairman Greenspan has so thoughtfully noted it is the extraordinarily productivity gains in recent years, largely tied to information technology, that has spurred economic growth, reduced joblessness and pushed a deficit ridden federal budget into surplus. Productivity gains have outstripped inflation, allowing unemployment to fall to levels that in prior times would have triggered rampant inflation.

Just as the Silicon Valley has bailed out America's political class, it has made savants of the Fed. Respect for the Fed increased in the 1980s when it reduced inflation despite Reagan-era budget deficits. And in the 1990s, in sharp contrast with attitudes toward Congress and the Executive Branch, respect for the Fed has giddily mushroomed -- indeed become rationally exuberant -- as it has stewarded an economy that has outstripped growth not only in Europe but Japan and a number of formerly fast growing economies of Asia.

In all fields except politics, America has never more thoroughly led the world. From the arts to science to business innovation, America is at the forefront of worldwide leadership. In the field of governance, the world has concluded that America today lacks quality politicians. But, nonetheless statecraft exists because our system is so strong and because specialized agencies of government, from defense to the intelligence services; from the State Department to the Exim Bank; from the SEC to the Treasury Department have on tap unprecedented professional expertise.

At the top of the governmental ladder of respect is the Federal Reserve, which is led today by the strongest chairman in its history. But care should be taken to understand that the individual at the top is less important than the independence and professionalism of the Fed itself. As fine a job as he has done, the country can get along without Alan Greenspan as chairman of the Fed. However, it would be in a pickle if the independence of the Federal Reserve were jeopardized.

Hence, as Banking Committee chair I consider my largest obligation to insist on accountability of the Fed to the Congress and the American people and, in return, for Congress to maintain Federal Reserve strength and independence.

Thank you.

**Summarized in delivery*

Special Studies on Technology and Banking

Who Offers Internet Banking?

by Karen Furst, William W. Lang, and Daniel E. Nolle[1]

1. Introduction

Banking over the Internet has attracted increasing attention over the past several years from bankers and other financial services industry participants, the business press, regulators, and lawmakers, both in the United States and in other countries. In part, this is due to the rapid and significant growth in electronic commerce ("e-commerce"), and the notion that electronic banking and payments will likely advance more or less in tandem with e-commerce. In addition, industry analyses outlining the potential impact of Internet banking on cost savings, revenue growth, and increased customer convenience have also generated considerable interest and speculation about the impact of the Internet on the banking industry. The public policy issues emerging with the development of Internet banking are also generating increased attention from banking regulators and other government officials. To date, however, because there is little systematic information on the nature and scope of Internet banking, much of the analysis of the benefits and impact of Internet banking has been based on anecdotal evidence and conjecture.

The main purpose of this article is to help fill significant gaps in existing knowledge about the Internet banking landscape. Using information drawn from a survey of national bank examiners, we present data on the number of national banks offering Internet banking and the products and services being offered. In addition, we project the extent of Internet banking at the beginning of 2001 implied by the survey. We also investigate how national banks offering Internet banking perform relative to other national banks with respect to profitability, cost efficiency, and other characteristics. We separately examine *de novo* (newly chartered) national banks to investigate the extent to which new entrants are embracing Internet banking technology to a different degree than existing banks.

Our main findings are:

- Only 20 percent of national banks offered Internet banking in the third quarter of 1999. However, as a group, these "Internet banks" accounted for almost 90 percent of national banking system assets, and 84 percent of small deposit accounts.[2]
- All of the largest national banks offered Internet banking, but only about 7 percent of the smallest size banks offered it. Among institutions offering Internet banking, large banks are much more likely than small banks to offer a broader range of services via the Internet.
- Banks in all size categories offering Internet banking tend to rely less on interest-yielding activities and core deposits than do non-Internet banks.
- Institutions with Internet banking outperformed non-Internet banks in terms of profitability. However, small *de novo* banks offering Internet banking performed more poorly than non-Internet *de novos*.
- Projecting from banks' plans as of the third quarter of 1999, 45 percent of all national banks will be offering Internet banking by the beginning of 2001. Those banks will account for 95 percent of the assets and 93 percent of the small deposit accounts at national banks.
- Most of the growth in new Internet banking will be due to small banks coming on-line. At the same time, almost half of all national banks had no plans to offer Internet banking.
- Customer use of Internet banking is disproportionately concentrated among a few large banks. Based on our analysis of data from private sector studies, we find that the five banks with the greatest number of on-line customers account for almost 36 percent of all Internet banking users. By comparison, these same five banks account for only 20 percent of small deposit accounts.

[1] The authors thank Steven Egli for excellent research assistance and Rebecca Miller for expert editorial advice. This article is based on Furst, Lang, and Nolle (2000). The data on Internet banking activities of national banks was compiled based on responses to a questionnaire OCC examiners completed between mid-August and mid-September 1999. We thank Bernard Locey for his help with that data.

[2] In this paper, we use the term "Internet bank" to mean a bank offering its customers the ability to transact business with the bank over the Internet. We do not confine the term to Internet-only or "virtual" banks. Customer transactions of Internet banking can be as simple as on-line balance inquiry or credit application, but also include such services as electronic bill presentment, insurance, and brokerage. "Non-Internet banks" refer to those banks that do not offer transactional Internet banking, even if they have a Web site.

The next section of this article defines Internet banking and provides context for our analysis. The third section describes our database and gives a description of the number and size distribution of national banks offering Internet banking. That section also provides information on the particular nature of Internet banking products and services offered by national banks. The fourth section compares the structure and performance of banks offering Internet banking with other banks, and the fifth section projects the extent of Internet banking at the beginning of 2001 based on the stated plans of national banks. The fifth section also discusses current and potential future demand for Internet banking using bank and industry estimates of customer use. The concluding sixth section summarizes our major findings.

2. Internet Banking: Definitions and Background

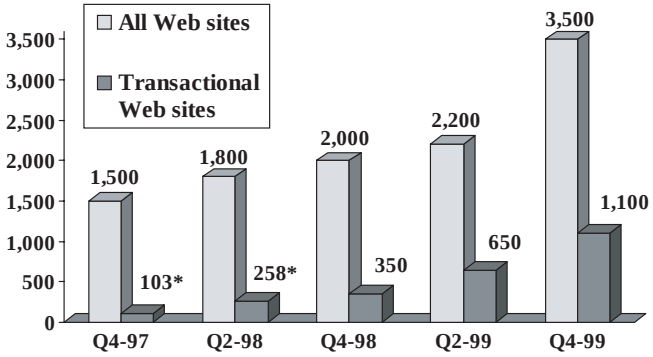
Internet banking refers to the use of the Internet as a remote delivery channel for banking services. Such services include traditional ones, such as opening a deposit account or transferring funds among different accounts, and new banking services, such as electronic bill presentment and payment, allowing customers to receive and pay bills via a bank's Web site.

Banks offer Internet banking in two main ways. An existing bank with physical offices can establish a Web site and offer Internet banking to its customers in addition to its traditional delivery channels. A second alternative is to establish a "virtual," "branchless," or "Internet-only" bank. The computer server that lies at the heart of a virtual bank may be housed in an office that serves as the legal address of such a bank, or at some other location. Virtual banks may offer their customers the ability to make deposits and withdraw funds via automated teller machines (ATMs) or other remote delivery channels owned by other institutions.

To date, it has been difficult to assemble comprehensive information on the Internet banking activities of commercial banks in the United States. In part this is because there are no special reporting requirements for a bank electing to reach customers via this new delivery channel, and hence there is no regularly compiled set of data about this attribute of banking.[3] In the recent past, at least two studies have appeared on the number of banks offering Internet banking, and some of their characteristics, but these relied on sampling methods for a banking industry profile, rather than an actual count of banks.[4] To our knowledge, only Egland, Furst, Nolle, and Robertson (1998), and Furst, Lang, and Nolle (2000) (from which this article is drawn) provide both an actual count of banks offering Internet banking and an analysis of major structure and performance characteristics of these banks.[5]

With this in mind, Figure 1 offers an approximation of the number of Internet banking sites from the end of 1997 through the end of 1999. During that time, according to estimates by the Federal Deposit Insurance Corporation (FDIC), and Couch and Parker (2000), the number of banks and thrifts with Web sites more than doubled from approximately 1,500 to 3,500; by year-end 1999, approximately one-third of the 10,000 U.S. banks and thrifts had Web sites. Approximately 1,100 of those Web sites were transactional, i.e., allowed customers to conduct business on-line, while the remainder were information-only sites.[6]

Figure 1—Estimated bank and thrift Web sites, and transactional Internet banking Web sites



*Actual.

Source: Office of the Comptroller of the Currency using data from the FDIC, Couch and Parker (2000), and bank and thrift Web sites

[3] Banks are also not required to report information about other delivery channels, such as ATMs and telephone banking. Note that beginning in 1999 the OTS has required prior notice for federally chartered thrifts, and in the third quarter of 1999 a line was added to the call report for all banks and thrifts to report their uniform resource locator (URL) (or Internet address).

[4] See United States General Accounting Office (1998), and the Board of Governors of the Federal Reserve System, Federal Deposit Insurance Corporation, Office of the Comptroller of the Currency, and the Office of Thrift Supervision (1999) (henceforth referred to as the "Interagency Web Site Privacy Report").

[5] As Egland, Furst, Nolle, and Roberston (1998) explain, there is an element of estimation even in that study. This is due to the fact that a single Web site may cover more than one bank that is a member of a multibank holding company. As a consequence, the authors distinguish between the number of Web sites and banks covered by those Web sites. See Egland, Furst, Nolle, and Robertson (1998), footnote 5.

[6] In the second quarter of 1998, Egland, Furst, Nolle and Robertson (1998) found that 223 Web sites represented 374 banks. Extrapolating from this ratio of 1.68 banks-per-banking company Web site, 18 percent of banks and thrifts offered true Internet banking as 2000 began.

While "virtual banks" have generated considerable attention in the press and within the banking industry, there were only nine separately chartered virtual banks at the beginning of 2000. Virtual banks are arising via several routes. One route is for new investors in the banking industry to obtain a charter from state or federal supervisory authorities to establish a new, independent virtual bank. Existing banking companies have also created virtual banks as separately capitalized subsidiary banks of a bank holding company. A third route that is beginning to be pursued by investors is to purchase the existing charter of a traditional bank, and then to recast the bank as a virtual bank under the existing charter.

As an alternative to seeking a separate charter for an Internet-only bank, "tradename" Internet banks have been established as separate divisions of an existing bank.[7] At the beginning of 2000, there were roughly 20 tradename virtual "banks" in the United States. A tradename virtual bank typically operates independently from the rest of the bank in terms of staffing, marketing, and integration of computer systems into the existing bank's legacy systems. This corporate strategy is based on a desire to capture advantages in operating style that many believe flow from having a virtual bank, and the desire to project a fresh image and thereby attract new customers. Both tradename and separately chartered virtual banks may find it difficult to attract customers without providing some form of physical contact with the bank.[8] Some virtual banks are considering establishing kiosks, limited-service offices, or other forms of physical presence in order to retain and attract customers.[9] Such a "clicks and bricks" approach could emerge as another main way to offer Internet banking.[10]

[7] For business press accounts of Internet-only banks, including several tradename banks, see Hallerman (1999a), Costanzo and Senior (1999), Daudelin (2000), *Financial Service Online* (2000), Giesen (2000), and O'Sullivan (2000a and b).

[8] See O'Sullivan (2000b) and Costanzo (2000) for discussions of the difficulties virtual banks face in the marketplace. O'Sullivan (2000b) reports on research evaluating the performance of virtual banks relative to traditional banks offering Internet banking. See also *Bank Technology News* (2000), which compares studies by CheckFree Corp. and GartnerGroup showing that consumers wishing to engage in electronic billing have a significantly stronger preference for dealing with a bank with a physical presence rather than an Internet-only bank.

[9] See, e.g., *Financial Service Online* (1999), *Bank Network News* (2000), Day (2000), and Toonkel (2000b).

[10] The option of moving away from an Internet-only strategy is receiving attention in businesses besides banking. See, for example, McIntyre and Christensen (1999) and Hamilton (2000).

3. Internet Banking in the National Banking System

The Data Set

The data set for the current study is unique in a number of respects. First, it covers the Internet banking offerings of every national bank. That information was compiled based on responses to a questionnaire OCC examiners completed between mid-August and mid-September 1999 for 2,535 national banks. The questionnaire covered whether a bank had a Web site, and, if so, whether the Web site was transactional. For banks with transactional sites, examiners provided a more detailed set of information on the nature of their sites, including information on the range of products offered. Examiners also answered questions about banks' plans for offering Internet banking in the future.

We matched the examiner-response data with financial data for the 2,517 national banks that filed a third quarter 1999 Report of Condition and Income (the "call report"), and we added banking structure data contained in the OCC's Integrated Banking Information System database. In addition, we included supervisory information on banks' CAMELS ratings, as well as on their information technology (IT) practices. While our data set is confined to national banks, we believe it is broadly applicable to the banking system at large.[11]

Number and Size Distribution of Internet National Banks

Based on daily articles in the business press, one might easily conclude that most banks offer Internet banking.[12] In fact, as Table 1 shows, while slightly more than half of all national banks had Web sites in the third quarter of 1999, only 464 national banks—just under 20 percent of all FDIC-insured national banks—offered transactional Internet banking to their customers.[13]

Although only a minority of institutions offer Internet banking, Table 2 shows that banks offering these services

[11] As of the third quarter of 1999, national banks accounted for 28 percent of all banks and 59 percent of all banking system assets. On average, national banks are larger than state banks but national banks are widely distributed across asset size categories, and by size category they exhibit the same performance characteristics as state banks. Egland, Furst, Nolle, and Robertson (1998) found no evidence of significant differences in the structural attributes of national and state banks offering Internet banking.

[12] For example, during the week of March 20–24, 40 percent of the articles in the *American Banker* dealt with Internet banking.

[13] As noted at the bottom of Table 1, this figure excludes credit card banks.

Table 1—Internet banking and national banks *(Q3 1999)*

	Number	Percent of national banks
National banks with Web sites	1,364	54.2
National banks with transactional Web sites	541	21.5
of which:		
FDIC-insured commercial national banks with transactional Web sites [a]	464	19.9 [b]
of which:		
Virtual banks [c]	1	[d]
Memorandum:		
Total national banks [e]: 2,517		
Total FDIC-insured national banks: 2,334 [a]		

Source: Office of the Comptroller of the Currency

[a] Excluding credit card banks.

[b] FDIC-insured commercial national banks with transactional Internet banking as a percent of all FDIC-insured national banks, excluding credit card banks.

[c] See the text for a definition of "virtual bank."

[d] Less than 1 percent.

[e] All national banks for which a third quarter 1999 call report was filed.

Table 2—Internet banks few in number, but dominant in key characteristics *(Q3 1999)*

	Transactional Internet national banks as a percent of all national banks	
Number of banks	19.9	
Assets [a]	89.2	
Small deposit accounts [b]	84.1	
	Transactional Internet national banks	Non-Internet national banks [c]
Average size (assets in $ millions)	5,880	180
Average number of employees	1,659	69
Average number of offices per bank [d]	61	5
Average number of employees per office	27	15
Percent of banks in urban areas [e]	72.2	42.6

Source: Office of the Comptroller of the Currency.

[a] Dollar value of assets.

[b] Percent of number of deposit accounts under $100,000.

[c] Includes banks with Web sites that are not transactional.

[d] Includes headquarters, branches, and non-branch offices.

[e] "Urban area" is defined as a Standard Metropolitan Statistical Area.

accounted for most of the assets in the national banking system. In addition, transactional Internet banks accounted for almost 85 percent of all deposit accounts under $100,000 in the national banking system. Such deposits are a reasonably good measure of consumer accounts at banks, and by implication, we can say that most consumers have accounts at banks that offer Internet banking. Virtually all of the evidence from market surveys indicates that consumer use of the Internet for banking transactions is currently quite limited. Those data suggest that this limited usage is primarily due to a lack of consumer demand for the current set of Internet banking products, rather than a lack of availability. The infrastructure is in place to allow for very rapid growth in the use of Internet banking if consumers become convinced that the services offered via the Internet are superior to the services offered through more traditional delivery channels.[14]

As a group transactional Internet banks had, on average, 33 times more assets, 24 times more employees, and 12 times more offices than non-Internet national banks. In addition, although Internet banking can enable a remotely located bank to reach potential customers anywhere, to date transactional Internet banks were more than one-and-a-half times more likely to be located in urban areas as were non-Internet banks.

Table 3 illustrates the size distribution of Internet and non-Internet banks. All of the largest banks (i.e., those with $10 billion or more in assets), and almost two-thirds of mid-to-large-size banks (i.e., those with between $1 billion and $10 billion in assets) offered Internet banking. By contrast, only 7 percent of small banks (i.e., those with under $100 million in assets) did. Nevertheless, it is clear that while large banks are far more likely to be transactional, small size is not a prohibitive barrier to offering Internet banking.

Key Internet Banking Services

Egland, Furst, Nolle, and Robertson (1998) showed that in mid-1998, most transactional Internet banks offered the services of balance inquiry and funds transfer between accounts. That generalization still applied in the third quarter of 1999, as Table 4 shows, although small transactional banks were somewhat less likely to offer these

[14] Recent analyses indicate that a large percentage of customers who sign up for Internet banking discontinue using it. See, e.g., Redman (1999), who summarizes the findings of a Cyber Dialogue study. Craig (1999) presents a theoretical analysis of the obstacles to changes in payment patterns. Also see Marks (1999), who compares the relative success of on-line brokerage to on-line banking.

Table 3—National banks offering transactional Internet banking: size distribution
(Q3 1999)

	Number of Internet banks	Internet banks as a percent of banks in size category	Average asset size of Internet banks relative to non-Internet banks [a]
Less than $100 million	85	7.1	0.95
$100 million to less than $1 billion	265	27.1	1.45
$1 billion to less than $10 billion	73	61.3	1.40
$10 billion and over	41	100.0	n.a.
Total	464	19.9	32.67

Source: Office of the Comptroller of the Currency.

[a] Non-Internet banks include those with a Web site that is not transactional.

n.a.: not applicable.

services.[15] There is a more significant divergence by size category in the proportion of banks offering electronic bill payment.[16] All of the very largest banks, and over 90 percent of banks in the $1 billion to $10 billion asset class, offer electronic bill payment. This drops to 77 percent for banks between $100 million and $1 billion, and to 60 percent for the smallest size category.

Looking at Internet banking services beyond balance inquiry, funds transfer, and bill payment, patterns of what is offered by banks of different sizes diverge greatly. In general, larger banks are more likely to accept credit applications on-line, but except for the smallest size category, there is no relationship between size and the ability to set up a new account via the Internet.

One notable feature of Table 4 is that banks of all sizes were roughly equally likely to offer on-line cash management services. Cash management is a key business-oriented service, and the Internet would seem to offer significant opportunities for banks to create value by improving the efficiency of cash management systems. Thus, offering this line of business may be an important determinant for how well small banks compete with larger institutions for business customers. As of the third quarter of 1999, it appeared that small banks were giving this business line as much focus as large banks. However, as Table 4 makes clear, only about 16 percent of all transactional banks offered this service, a percentage far below that for most other on-line products for which we collected data.[17]

Table 4 also contains information on the extent particular business lines—brokerage, fiduciary, and insurance

[15] Most of the banks that did not offer balance inquiry or funds transfer at a minimum offered on-line credit applications.

[16] Electronic bill payment allows a bank's customers to instruct the bank to make payments electronically. The bank then either sends an automated clearinghouse (ACH) payment or a paper check. In either case, the customer's account is debited for the amount of the payment.

[17] In the first quarter of 1999, Pizzani (1999) reported that "banks have largely ignored the online banking needs of small businesses." As we discuss in the section on banks' plans (below), it appears that bankers are planning to increase dramatically their emphasis on business Internet banking services.

Table 4—Key services offered by transactional Internet national banks
(Q3 1999)

	Percent of transactional Internet banks offering selected services (by asset size category)				
Type of service	All banks	Less than $100 million	$100 million to less than $1 billion	$1 billion to less than $10 billion	$10 billion and over
Balance inquiry and funds transfer	88.8	74.1	90.2	94.5	100.0
Bill payment	78.2	60.0	77.4	90.4	100.0
Bill presentment	10.6	7.1	7.9	16.4	24.4
Credit applications	60.0	51.8	51.7	75.3	80.5
New account set-up	36.6	29.8	43.9	45.2	43.9
Cash management	15.7	14.1	16.2	15.1	17.1
Brokerage	21.6	10.6	14.7	41.1	53.7
Fiduciary	11.9	3.5	9.8	12.3	41.5
Insurance	5.4	2.4	2.3	6.8	29.3

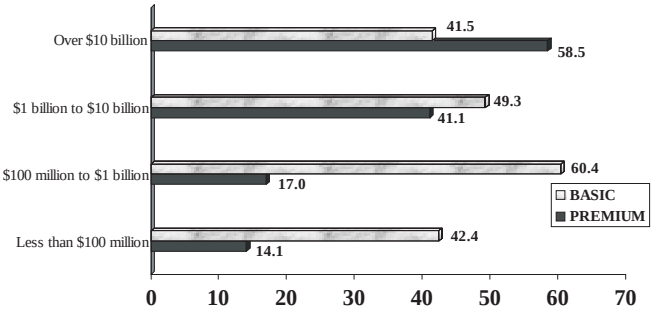
Source: Office of the Comptroller of the Currency.

services—were offered on-line. Consistent with their practices in the physical world, larger banks are much more likely to offer brokerage services than smaller banks; the on-line pattern is less clear for offerings of insurance and fiduciary services, although banks under $100 million in assets are least likely to offer any of these services.[18]

To gain a clearer picture of the typical range of Internet services available at banks in different size categories, we defined two alternative "menus" of Internet banking services. "BASIC" Internet banking is defined as the three core Internet banking services of balance inquiry, funds transfer, and bill payment. We define "PREMIUM" Internet banking as BASIC plus at least three other services. Figure 2 compares the proportion of banks by size category that offer just BASIC services to those that offer a PREMIUM set of Internet banking products. In the smaller size categories, Internet banks are more likely to offer just the BASIC range of services, compared to the larger size categories of Internet banks. But almost 60 percent of the largest banks offer PREMIUM Internet banking services, whereas only 14 percent of the smallest banks have extended product menus. More generally, banks over $1 billion in assets are at least two-and-a-half times more likely than banks under $1 billion in size to offer customers a PREMIUM package of services. Hence, the evidence indicates that, while small banks can establish an on-line presence, they are currently less likely to compete with large banks on the basis of the range of product offerings. To the extent product variety is a key factor in attracting and maintaining a strong customer base, small banks may be at a disadvantage relative to large banks.

Figure 2—Larger banks offer a greater range of Internet banking services

Percent of transactional Internet national banks offering BASIC and PREMIUM service
(Q3 1999)*



*BASIC service includes balance inquiry, funds transfer, and bill payment. PREMIUM service includes BASIC and at least three other on-line services.

Source: Office of the Comptroller of the Currency

[18] As Table 4 shows, 41.5 percent of the largest transactional banks offer fiduciary services on-line. That percent is lower than the percent of the largest banks offering 6 of the other 10 on-line services. This relatively low percentage appears to be consistent with more general findings about the somewhat lackluster competitive position of large banks in offering retirement services, both on-line and via traditional channels. See Robertson, Cambruzzi, Jacques, Nigro, Pate, Rich, and Steele (2000) for a detailed study of this issue.

Web Site Privacy Statements

Both banks and their customers stand to benefit substantially from the increased ability to collect and analyze information obtained via the Internet. In particular, both banks and customers can benefit from the collection and integration of large amounts of personal information that enhance the ability of banks to offer a wide range of products tailored to individual demands. However, these same information collection, analysis, and distribution activities raise questions related to personal privacy protection.[19] A basic step many banks are taking to address on-line privacy issues is to post a statement of their policies about the collection and use of customer information. Our database includes information on how many transactional banks had such a statement on their Web site. Table 5 summarizes that information.[20]

More than four-fifths of transactional Internet banks included a privacy policy statement on their Web site in the third quarter of 1999. That represents a large increase

Table 5—Substantial increases in number of Web site privacy policy statements

	Percent of transactional Internet national banks with a privacy policy statement on the Web site		
Asset size category	Second quarter 1998	Fourth quarter 1998	Third quarter 1999
All	40.9	54.5	83.8
Under $100 million	21.4	35.7	75.0
$100 million to less than $1 billion	32.6	41.3	79.5
$1 billion to less than $10 billion	37.5	62.5	97.7
$10 billion and over	75.0	95.0	100.0

Source: Office of the Comptroller of the Currency; Egland, Furst, Nolle, and Robertson (1998).

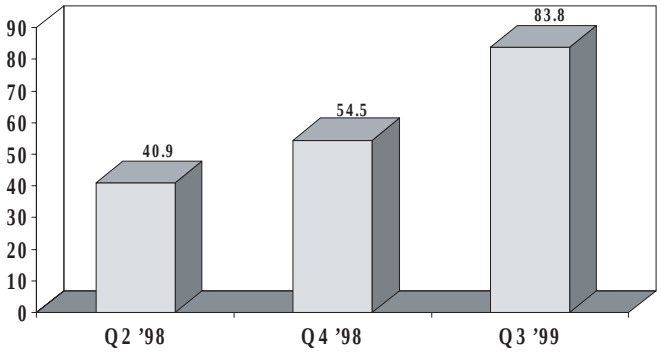
[19] See Office of the Comptroller of the Currency (1999a) for a discussion of privacy issues facing banks offering Internet banking.

[20] Note that our data is confined to whether or not transactional Internet banks posted an on-line privacy statement; it does not include an evaluation of the nature of banks' privacy statements. For an analysis of attributes of the on-line privacy statements of depository institutions, see the Interagency Web Site Privacy Report (1999).

from just over 50 percent at the end of 1998, and more than a doubling since mid-1998.[21] Large banks were more likely to post an on-line privacy policy than small banks. Indeed, 100 percent of the largest banks included on their Web sites a statement about the collection and use of customer information, and almost all banks over $1 billion in asset size did so, as compared to 75 percent of the smallest banks. However, the discrepancy between large and small bank practices in this respect narrowed considerably during 1999. Figure 3 illustrates the fact that on-line privacy statements have become more common for transactional Internet banks over time.

Figure 3—Most transactional Internet national banks have an on-line privacy statement

Percent of transactional Internet national banks with an on-line privacy statement



Source: Office of the Comptroller of the Currency

4. Internet and Non-Internet Banks: Performance Comparisons

In comparing transactional Internet banks in mid-1998 to non-Internet banks, Egland, Furst, Nolle, and Robertson (1998) found little besides relative size to distinguish the two groups. As Tables 6, 7, and 8 illustrate, by the third quarter of 1999, differences between Internet and non-Internet banks had begun to emerge in balance sheet composition and funding, in sources of income and expenditures, and in measures of performance.[22]

[21] See Egland, Furst, Nolle, and Robertson (1998) for further information on the 1998 figures.

[22] We make extensive use of univariate comparisons between Internet and non-Internet bank characteristics. Because the importance of bank size has already been established, we "control" for differences in bank size, roughly speaking, by stratifying the data by asset size categories. This "first-step" approach is useful for an initial investigation to establish a foundation of stylized facts. Furst, Lang, and Nolle (2000) include multivariate statistical methods.

Portfolio Composition, Income, and Expenses

Table 6 shows major lending and funding characteristics for Internet and non-Internet banks.[23] Overall, on the asset side, Internet banks have a relatively greater focus on business lending (commercial and industrial loans) and credit card lending. On the liability side, Internet banks generally are less reliant on core deposits for funding and make greater use of purchased funds relative to deposits. For small banks, this result is consistent with recent business press reports that they are concerned about traditional sources of funding, and that small banks have begun to view the addition of Internet banking as a way to offer products that reduce their dependence on core deposits.[24]

Differences in business strategies between Internet and non-Internet banks are also evident in Table 7. The first column in Table 7 shows the ratio of noninterest income to net operating revenue. This ratio is a rough proxy for the amount of revenue being generated by "non-traditional" activities. Internet banks generated a substantially higher proportion of their income from non-traditional activities compared to non-Internet banks. Roughly speaking, Internet banks received about 50 percent more of their revenue from noninterest income when compared to non-Internet banks. That pattern is consistent with a business strategy of using the Internet to target businesses and more affluent consumers, in the belief that these customers will be interested not only in loans but in other services that yield fee income.[25]

[23] In the tables throughout the remainder of the paper comparing structure and performance characteristics of Internet to non-Internet banks, we calculated a difference of means test to ascertain the likelihood that Internet banks and non-Internet banks were different with respect to a given characteristic. For each pair of observations in a table, we provide a probability value (p-value) for the hypothesis that the means in the Internet and non-Internet samples are the same. A lower p-value indicates a greater likelihood that the two figures being compared represent real differences between categories of banks (i.e., Internet vs. non-Internet, etc.). A common practice in empirical economics is to consider p-values at or below 0.05 as indicating a statistically significant difference, while some studies (particularly ones with small samples) use a cut-off point of 0.10 for asserting statistical significance.

[24] See, e.g., Winig (2000), who reports that 85 percent of community bank CEOs who participated in a recent Grant Thornton survey agreed with the statement that "Funding with core deposits will be more difficult in three years," because consumers continue to look for higher-yielding alternatives to bank accounts. Correspondingly, the same survey reveals a surge in community banker interest in offering Internet banking.

[25] See Gold (2000) for example. *Bank Technology News* (1999d) sites a Forrester Research Inc. study showing that higher income individuals are more likely to be active Internet banking users.

Table 6—Internet and non-Internet national banks: selected balance sheet ratios [a, b]
(Q3 1999)

	Loan composition ratios (in percent)		Funding ratios (in percent)	
Asset size category	C&I loans/loans	Credit card loans/loans	Deposits/assets	Fed funds purchased/deposits
Less than $100 million:				
Internet banks	20.4	0.5	82.1	2.1
Non-Internet banks	16.9	0.4	85.1	1.5
(p-value)	(0.001)***	(0.691)	(0.000)***	(0.276)
$100 million to $1 billion:				
Internet banks	17.9	1.7	78.9	7.4
Non-Internet banks	18.1	0.9	82.3	3.9
(p-value)	(0.209)	(0.000)***	(0.000)***	(0.000)***
$1 billion to $10 billion:				
Internet banks	24.5	4.2	68.6	20.4
Non-Internet banks	17.8	0.9	71.8	12.1
(p-value)	(0.003)***	(0.011)**	(0.299)	(0.023)**
$10 billion and over:				
Internet banks	34.1	2.8	66.1	11.7

Source: Office of the Comptroller of the Currency

[a] Numbers in parentheses are probability values (p-values) for a statistical test of the hypothesis that the mean values in each cell are equal. Thus, a smaller p-value indicates a greater likelihood that the true mean value of the Internet sample differs from the non-Internet sample. Asterisks indicate the statistical significance of the difference of means test with:

*** = significant at the 1% level

** = significant at the 5% level

* = significant at the 10% level

[b] Non-Internet banks include banks with non-transactional Web sites.

C&I = commercial and industrial

In addition to revenue enhancement, Internet banking could enable banks to reduce costs of operation. In particular, greater reliance on Internet banking might allow banks to reduce expenditures on "bricks and mortar." To the extent this is so, Internet banking would be considered a *causal* factor in generating lower expenses related to maintaining physical branches. On the other hand, one might expect that banks with relatively high expenses in maintaining their branch networks might have the greatest incentive to adopt Internet banking. From this perspective, the adoption of Internet banking would be the *effect* of existing characteristics of banks. The data in Table 7 shows that, consistent with the first hypothesis, Internet banks over $100 million in asset size had lower expenses on building and equipment relative to net operating revenue. However, among the smallest size Internet banks—the majority of which adopted Internet banking after the second quarter of 1998—building and equipment expenditures were higher than for non-Internet banks. This might indicate that smaller banks with high costs of maintaining a branch are motivated to adopt Internet banking by the prospect of future cost savings. However, because the call report data aggregates expenditures on buildings and equipment, this result might be due to high initial costs of equipment for small banks seeking to establish an on-line presence. Further research is necessary to establish whether Internet banking will likely reduce costs associated with physical branch networks, and whether relatively high branch-related expenses is a causal factor in the adoption of Internet banking.

Performance Measures

Even the banks most successful at offering Internet banking currently serve a relatively small share of their customer base with this delivery channel.[26] As a result, it has been difficult for banks and industry analysts to determine yet if Internet banking has had a significant impact on

[26] The penultimate section of this article discusses "demand" for Internet banking in more detail.

Table 7—Income and expenses: Internet and non-Internet national banks [a, b] *(Q3 1999)*

Asset size category	"Non-traditional" income: Noninterest income/net operating revenue [c] (percent)	Expenses: Premises and fixed assets/net operating revenue [c] (percent)
Less than $100 million:		
Internet banks	22.0	11.7
Non-Internet banks	14.6	9.3
(p-value)	(0.000)***	(0.000)***
$100 million to $1 billion:		
Internet banks	23.1	8.2
Non-Internet banks	16.8	9.1
(p-value)	(0.000)***	(0.000)***
$1 billion to $10 billion:		
Internet banks	36.8	7.2
Non-Internet banks	23.0	8.0
(p-value)	(0.000)***	(0.111)
$10 billion and over:		
Internet banks	40.1	8.1

Source: Office of the Comptroller of the Currency

[a] Numbers in parentheses are probability values (p-values) for a statistical test of the hypothesis that the mean values in each cell are equal. Thus, a smaller p-value indicates a greater likelihood that the true mean value of the Internet sample differs from the non-Internet sample. Asterisks indicate the statistical significance of the difference of means test with:

*** = significant at the 1% level

** = significant at the 5% level

* = significant at the 10% level

[b] Non-Internet banks include banks with non-transactional Web sites.

[c] Net operating revenue = net interest income plus noninterest income.

bank performance.[27] For example, in their comparison of Internet and non-Internet banks in mid-1998, Egland, Furst, Nolle, and Robertson (1998) observed that they did not find significant differences in profitability, efficiency, or credit quality. But, as our new information shows, by the third quarter of 1999, differences between Internet and non-Internet banks in performance had emerged.

Table 8 compares the performance of Internet banks with non-Internet banks in the third quarter of 1999. What stands out most distinctly in this table are the performance differences between the Internet banks and non-Internet banks in the smallest size category compared to larger banks. For example, while Internet banks over $100 million in assets were more profitable than non-Internet banks, Internet banks in the smallest size category were significantly less profitable than non-Internet banks.[28] The smallest size banks were also less efficient than non-Internet banks, as measured by the ratio of noninterest expense to net operating revenue ("accounting efficiency"), a commonly used measure of cost efficiency.[29] There was no statistically significant difference between the accounting efficiency of Internet and non-Internet banks in the larger size categories. The smallest size Internet banks had better credit quality than non-Internet banks; for the larger size banks there is a less distinct pattern. As we will discuss further, the differences for small banks were likely due to the relative performance of *de novo* banks that offered Internet banking.

Interestingly, noncurrent loans were significantly higher for Internet banks in the $1 billion to $10 billion assets size category. This is consistent with our previous results in Table 6 that showed that these banks were more heavily concentrated in credit card and business lending than similarly sized non-Internet bank. Internet banks in the smallest size category have relatively fewer noncurrent loans as compared to their non-Internet peers. This suggests that the relatively poor profitability and accounting efficiency ratios at these banks are due to factors not associated with credit losses.

De Novo Banks

To investigate further the performance differences of small banks, we focused on two different groups of Internet banks: *de novo* Internet banks, i.e., those banks that offered Internet banking and had been in operation a year or less as of the third quarter of 1999; and "mature" Internet banks, i.e., those banks which Egland, Furst, Nolle, and Robertson (1998) had determined offered Internet banking at least as far back as the second quarter of 1998. Segmenting our data this way allowed us to investigate two possible reasons small Internet banks per-

[27] See, for example, Azarchs (2000) and Jordan and Katz (1999). In a recent study, Moody's Investors Service (2000a) says that "Moody's does not foresee much impact from the Internet on large U.S. banks' core profitability or competitive position—at least in the intermediate term." Somewhat in contrast, Azarchs (2000) cites a Booz Allen & Hamilton Inc. study arguing that "a mature Internet bank could operate at a 15%–20% expense-to-revenue ratio" compared to a ratio of about 60 percent for most banks. Hitt, Frei, and Harker (1999) found that banks' investment in Internet banking had not resulted in "new, profitable customers to the firm, as many banks had hoped. Rather, it seems to be to retain high-value customers" (p. 132), a result echoed in Hitt and Frei (1999).

[28] We also used return on assets as a measure of profitability and found very similar results.

[29] Following DeYoung (1999), we use the term "accounting efficiency" for this measure of cost efficiency.

Table 8—Internet banks and non-Internet national banks: performance comparisons [a, b]
(Q3 1999)

Asset size category	Profitability: Return on equity (percent)	Accounting efficiency: Noninterest expense to net operating revenue [c] (percent)	Credit quality: Noncurrent loans to total loans [d] (percent)
Less than $100 million:			
Internet banks	6.34	77.90	0.52
Non-Internet banks	10.13	65.52	0.87
(p-value)	(0.000)***	(0.000)***	(0.002)***
$100 million to $1 billion:			
Internet banks	14.15	59.59	0.68
Non-Internet banks	13.03	60.57	0.73
(p-value)	(0.000)***	(0.282)	(0.249)
$1 billion to $10 billion:			
Internet banks	18.26	56.26	0.81
Non-Internet banks	15.68	54.74	0.56
(p-value)	(0.003)***	(0.256)	(0.003)***
$10 billion and over:			
Internet banks	15.35	57.84	0.82

Source: Office of the Comptroller of the Currency

[a] Numbers in parentheses are probability values (p-values) for a statistical test of the hypothesis that the mean values in each cell are equal. Thus, a smaller p-value indicates a greater likelihood that the true mean value of the Internet sample differs from the non-Internet sample. Asterisks indicate the statistical significance of the difference of means test with:

*** = significant at the 1% level

** = significant at the 5% level

* = significant at the 10% level

[b] Non-Internet banks include those with non-transactional Web sites.

[c] A higher ratio indicates lower efficiency.

[d] A higher ratio indicates lower credit quality.

formed more poorly than small non-Internet banks: ''newness'' of banks, and ''newness'' of Internet banking.

De novo banks as a rule perform more poorly than established banks, a pattern that generally holds for at least their first three years.[30] Because most *de novo* banks fall into the small size category (i.e., banks with less than $100 million in assets), we reasoned that their performance could have affected the measures of performance for the entire group of small banks.[31] That suspicion was heightened by our discovery that, among small banks, *de novo* banks as a group were three times more likely to offer Internet banking than mature small banks.[32] In addition, it is reasonable to conjecture that the performance of a *de novo* bank might be significantly affected by its choice to offer Internet banking. On the cost side, there may be one-time set-up expenses as well as ongoing expenses for advertising and operating this delivery channel.[33] On the revenue side, *de novo* banks offering Internet banking may have difficulty in attracting customers via the Internet. In light of this, we separated *de novo* national banks from the rest of the small national banks.

Table 9 compares the nine *de novo* Internet national banks and 47 *de novo* non-Internet national banks in the third quarter of 1999 across key performance characteristics. The *de novo* Internet banks had much lower profitability, and greater inefficiency, than did *de novo* non-Internet banks. In a proximate sense, one key contributing factor to these results was that *de novo* Internet banks exhibited a much higher expense ratio than did non-Internet *de novo* banks. As discussed previously, the data

[30] See DeYoung (1999) for a recent analysis of the performance of *de novo* banks.

[31] Fifty-six of the 59 (one year or younger) *de novo* national banks in the third quarter of 1999 were in the under $100 million asset size category.

[32] As the memorandum item in Table 9 shows, 19.2 percent of small *de novo* banks offered Internet banking, while only 6.1 percent of ''mature'' small banks offered Internet banking.

[33] This may be true even if much of the set-up and operation of the bank's Internet banking is outsourced to third-party vendors.

Table 9—Performance comparisons of *de novo* national banks: Internet banks performed worse than non-Internet banks [a, b] *(Q3 1999)*

	Internet *de novo* banks		Non-Internet *de novo* banks [c]
Number of banks	9		47
Profitability [d]	−14.70		−8.64
(p-value)		(0.082)*	
Accounting efficiency [e]	238.09		133.14
(p-value)		(0.024)**	
Premises and fixed assets-to-net operating revenue (percent)	33.36		19.60
(p-value)		(0.002)***	
"Traditional" income [f]	87.86		75.99
(p-value)	(0.253)		

Memorandum: Among small banks, *de novo* banks are more than three times as likely to offer Internet banking as banks in existence three years or more:

Percent of de novo banks that offered Internet banking: 19.2

Percent of mature small banks that offered Internet banking: 6.1

Source: Office of the Comptroller of the Currency.

[a] *De novo* banks are those in the $100 million or less asset size category operating for one year or less as of the third quarter of 1999.

[b] Numbers in parentheses are probability values (p-values) for a statistical test of the hypothesis that the mean values in each cell are equal. Thus, a smaller p-value indicates a greater likelihood that the true mean value of the Internet sample differs from the non-Internet sample. Asterisks indicate the statistical significance of the difference of means test with:

*** = significant at the 1% level

** = significant at the 5% level

* = significant at the 10% level

[c] Non-Internet banks include those with Web sites that are not transactional.

[d] Return on equity, in percent.

[e] Noninterest expense to net operating revenue, in percent. A higher ratio indicates lower efficiency.

[f] Net interest income to net operating revenue, in percent.

do not allow us to ascertain the composition of the expenditures for premises and fixed assets. Nevertheless, it is possible that expense ratios were higher for *de novo* Internet banks in part because of costs incurred to set up Internet banking.[34]

[34] Table 9 also shows that *de novo* Internet banks received a higher proportion of their revenue from traditional interest income than did non-Internet *de novos*. While the statistical significance of this result is weak, it stands in marked contrast to the significantly lower reliance on traditional income by Internet banks in other size categories. That outcome could reflect difficulties for *de novo* Internet banks in successfully attracting customers who generate fee income.

Internet Experience and Bank Performance

Clearly, the combination of being a new bank and of offering Internet banking results in relatively poor performance. But it is also possible that the poor performance of small Internet banks versus non-Internet banks is the result of short-run costs of making an investment in Internet banking, one that could be expected to yield substantial gains in the longer run. Few banks have had Internet banking for more than several years, so it is difficult to ascertain what the "long run" is with respect to Internet banking. Nevertheless, our data allow us to explore whether, among *mature* small banks offering Internet banking, those that have offered it for a relatively long time outperformed those that only recently began to offer it.[35] Making such a comparison separates "newness of bank" from "newness of Internet banking."

The results of subtracting *de novos* and then segmenting mature small Internet banks by "Internet experience" are presented in Tables 10 and 11. Table 10 shows that there is no statistically significant difference between the profitability of the 1,009 non-Internet small national banks and the 61 Internet small national banks. That is, the lower profitability for non-Internet banks compared to small Internet banks, displayed in Table 8, completely disappears as a result of excluding *de novo* banks. However, small Internet banks still exhibit greater inefficiency than small non-Internet banks, despite the exclusion of *de novo* banks. Hence, it is not the newness of the bank that explains this aspect of worse performance for small Internet banks.

In order to investigate whether "newness of offering Internet banking" might explain the poorer efficiency results for small Internet banks, we divided the 61 small Internet banks into two groups. "Internet-experienced" banks are those that offered Internet banking no later than the second quarter of 1998, and "Internet-inexperienced" banks are those that began to offer Internet banking sometime between the beginning of the third quarter of 1998 and the end of the third quarter of 1999.[36] We then

[35] We define "mature" banks as those in operation for more than three years as of the third quarter of 1999. We compared the performance of "Internet-experienced" banks (i.e., those offering Internet banking since at least the second quarter of 1998) to that of banks that began offering Internet banking after the second quarter of 1998, for all size categories. We found no statistically significant difference in performance between those two "vintages" of Internet banks in the banks over $100 million in assets. Hence, our discussion in the text is confined to the smallest size banks.

[36] As indicated previously, we have no record of the exact date banks began offering Internet banking to their customers.

Table 10—Mature small national banks: Internet banks are less efficient, but not less profitable [a,b] *(Q3 1999)*

	Non-Internet banks		Internet banks
Number of banks	1,009		61
Profitability [c]	11.13		10.36
(p-value)		(0.232)	
Accounting efficiency [d]	64.50		70.50
(p-value)		(0.000)***	
Premises and fixed assets-to-net operating revenue	9.02		10.41
(p-value)		(0.000)***	
"Traditional" income [e]	85.51		78.24
(p-value)		(0.000)***	

Source: Office of the Comptroller of the Currency.

[a] "Mature" small banks are those in the $100 million or less asset size category in operation for more than three years as of the third quarter of 1999. Non-Internet banks include those with Web sites that are not transactional.

[b] Numbers in parentheses are probability values (p-values) for a statistical test of the hypothesis that the mean values in each cell are equal. Thus, a smaller p-value indicates a greater likelihood that the true mean value of the Internet sample differs from the non-Internet sample. Asterisks indicate the statistical significance of the difference of means test with:

*** = significant at the 1% level

** = significant at the 5% level

* = significant at the 10% level

[c] Return on equity, in percent.

[d] Noninterest expense to net operating revenue, in percent. A higher ratio indicates lower efficiency.

[e] Net interest income to net operating revenue, in percent.

compared both the small Internet-experienced and the Internet-inexperienced banks to small non-Internet banks.

The results of those comparisons are summarized in Table 11. That table shows that there is no statistical difference between the accounting efficiency of Internet-experienced banks compared to non-Internet banks. However, those small banks only recently offering Internet banking exhibited statistically significant poorer accounting efficiency than non-Internet banks. Hence, the lower efficiency of small Internet banks as a group is attributable to those small Internet banks just recently beginning to offer Internet banking; i.e., it appears that Internet experience does matter for small banks.

Table 11 also shows that, for a key measure of "input" costs—the ratio of premises and fixed assets to net operating revenue—Internet-inexperienced banks were significantly worse than non-Internet banks. This fact helps explain the greater inefficiency of small banks for which Internet is relatively new. However, the results in Table 11 also suggest that higher expense ratios and lower efficiency may disappear as small banks gain experience in offering Internet banking, inasmuch as Internet-experienced banks showed no statistical differences in those two performance measures compared to non-Internet banks. It is possible that the expense and efficiency disadvantages may be a temporary consequence of investing in Internet banking.[37] It is interesting to note that neither the Internet-experienced nor the Internet-inexperienced banks exhibited statistically different profitability compared to non-Internet banks, but both groups of Internet banks were less reliant on traditional interest-yielding activities compared to non-Internet banks. Those results suggests that small banks that have only recently begun to offer Internet banking are not performing poorly on the "output" side of operations.

Safety, Soundness, and Information Technology

Federal bank regulators regularly examine for safety and soundness and issue composite CAMELS ratings for each bank. The rating is based on capital, asset quality, management, earnings, liquidity, and sensitivity to market risk (CAMELS). The CAMELS ratings can range from 1 (best rating) to 5 (worst rating). Similarly, there are separate bank examinations that evaluate key aspects of the information technology (IT) risk management practices of banks, using the Uniform Rating System for Information Technology (URSIT).[38] As with the CAMELS ratings, IT exam scores can range from 1 to 5.

Table 12 compares the composite and management components of the CAMELS and IT ratings for Internet and non-Internet banks by size category. The table shows that, overall, Internet banks have similar ratings to non-Internet banks. Because relatively few banks offered Internet banking, one might expect that the "early adopters" would be more forward-looking and astute with

[37] The statistical results do not allow us to say for certain that "newness of Internet" for small banks causes poorer efficiency. It is possible that another set of factors explains both why some small banks chose not to be in the vanguard of banks offering Internet banking, and why they had poorer accounting efficiency ratios than did the 11 Internet-experienced banks that were among the "early adopters" of Internet banking.

[38] See the *Federal Register*: January 20, 1999 (volume 64, number 12, pp. 3109–3116) for a detailed description of the URSIT, which is "an internal supervisory examination rating system used by federal and state regulators to assess uniformly financial institution and service provider risks introduced by information technology and for identifying those institutions and service providers requiring special supervisory attention." Note, therefore, that URSIT exams are given to service providers over which regulators have supervisory authority, as well as to banks.

Table 11—Mature small national banks: Does Internet experience matter? [a, b]
(Q3 1999)

	Non-Internet banks	Internet-experienced banks	Internet-inexperienced banks
Number of banks	1,009	11	50
Profitability [c]	11.13	9.95	10.58
(p-values)		(0.400)	(0.434)
Accounting efficiency [d]	64.50	63.10	71.61
(p-values)		(0.641)	(0.000)***
Premises and fixed assets-to-net operating revenue	9.02	7.99	10.85
(p-values)		(0.233)	(0.000)***
"Traditional"income [e]	85.51	75.94	75.25
(p-values)		(0.000)***	(0.000)***

Source: Office of the Comptroller of the Currency.

[a] "Mature" small banks are those in the $100 million or less asset size category in operation for more than three years as of the third quarter of 1999. Non-Internet banks include those with Web sites that are not transactional. "Internet-experienced" banks are those that have offered Internet banking since at least the second quarter of 1998. "Internet-inexperienced" banks are those that began to offer Internet banking after the second quarter of 1998.

[b] Numbers in parentheses are p-values for the difference of means tests for Internet-experienced banks compared to non-Internet banks, and for Internet-inexperienced banks compared to non-Internet banks, respectively. The p-values are probability values for a statistical test of the hypothesis that the mean values in each cell are equal. Thus, a smaller p-value indicates a greater likelihood that the true mean value of the Internet sample differs from the non-Internet sample. Asterisks indicate the statistical significance of the difference of means test with:

*** = significant at the 1% level

** = significant at the 5% level

* = significant at the 10% level

[c] Return on equity, in percent.

[d] Noninterest expense to net operating revenue, in percent. A higher ratio indicates lower efficiency.

[e] Net interest income to net operating revenue, in percent.

respect to technology than non-Internet banks, and that this astuteness would be reflected in examiner ratings. The figures displayed in Table 12 provide weak support for this conjecture, inasmuch as Internet banks generally had lower (better) IT and CAMELS ratings than non-Internet banks. But, because the p-values generally are above 0.10, there is little statistical significance to the difference in the ratings.[39]

5. Internet Banking: Plans and Prospects

The allure of Internet banking is a strong one, to which many banks are responding.[40] In this section we present information on banks' plans for offering Internet banking. Our data set includes OCC examiners' responses to questions about the Internet banking plans of national banks through the end of 2000. Combining information about banks' future plans with the information on third quarter 1999 Internet banking activities allows us to project the "supply" of Internet banking in the United States as 2001 begins.[41] We then contrast this projected

[39] The relative weakness of these results might be due to the overall strength of national banks during this period, and the resultant relatively strong supervisory ratings. See Office of the Comptroller of the Currency (1999b) for an analysis of national banking industry performance during the third quarter of 1999.

There is evidence showing that banks that effectively manage IT realize greater stock prices. See *Bank Technology News* (1999a), which cites a Barents study comparing stock prices of "well-run IT banks" to the banking industry average, 1992–1998. See also O'Sullivan (1998), who summarizes research suggesting that IT spending on technology staff boosts profitability.

[40] See, for example, *Retail Delivery News* (2000). A recent Ernst & Young study estimated that for the first time, bankers rated investment in Internet technology as their top technology spending priority. For a summary of the results of that study see *Bank Technology News* (1999e). In addition, Rhoads and Portanger (2000) report that pursuing an Internet-based strategy was a principal motivation behind the recent announcement of the merger of Deutsche Bank and Dresdner Bank, a combination that could create the largest bank in the world.

[41] Of course, our projections are accurate only to the extent that banks carry through with their plans.

Table 12—Safety and soundness, and information technology examination ratings: Internet banks similar to non-Internet banks [a]
(Q3 1999)

	CAMELS ratings [b]		IT ratings [c]	
Asset size category	Composite	Management	Composite	Management
Less than $100 million:				
Internet banks	1.72	1.73	1.66	1.81
Non-Internet banks	1.75	1.84	1.81	1.84
(p-value)	(0.676)	(0.135)	(0.155)	(0.803)
$100 million to less than $1 billion				
Internet banks	1.52	1.58	1.64	1.66
Non-Internet banks	1.63	1.68	1.74	1.77
(p-value)	(0.009)***	(0.023)***	(0.059)**	(0.055)**
$1 billion to less than $10 billion				
Internet banks	1.50	1.63	1.70	1.80
Non-Internet banks	1.64	1.70	1.61	1.68
(p-value)	(0.182)	(0.132)	(0.539)	(0.510)
$10 billion and over				
Internet banks	1.63	1.56	1.81	1.89

Source: Office of the Comptroller of the Currency

[a] Numbers in parentheses are probability values (p-values) for a statistical test of the hypothesis that the mean values in each cell are equal. Thus, a smaller p-value indicates a greater likelihood that the true mean value of the Internet sample differs from the non-Internet sample. Asterisks indicate the statistical significance of the difference of means test with:

*** = significant at the 1% level

** = significant at the 5% level

* = significant at the 10% level

[b] CAMELS ratings range from 1 (highest) to 5 (lowest).

[c] IT ratings (Uniform Rating System for Information Technology) range from 1 (highest) to 5 (lowest).

"supply" of Internet banking with information about possible future use of, or "demand" for, Internet banking.

Internet Banking Plans of National Banks

Table 13 summarizes key aspects of these projections. Based on responses to the examiner questionnaire, the number of national banks offering Internet banking would more than double from third quarter 1999 levels, so that by the beginning of 2001, 45 percent of national banks will be offering Internet banking. Banks offering transactional Internet banking would then account for more than 95 percent of national banking system assets. Because the largest banks already had Internet banking in the third quarter of 1999, most of the growth in the number of banks offering Internet banking will be from the smallest size banks. In the third quarter of 1999, only 7 percent of small banks (i.e., those with less than $100 million in assets) offered Internet banking, but our projections indicate that by year-end 2000 more than one-quarter of small banks will offer Internet banking. In addition, by the beginning of 2001, almost all national banks over $1 billion will offer Internet banking. Together, national banks offering Internet banking could account for almost 93 percent of consumer-type deposits in national banks. To the extent the national banking industry is representative of the entire banking industry, that suggests that more than 9 out of 10 banking industry customers will have access to Internet banking by the beginning of 2001.

In addition to an increase in the number of banks offering Internet banking, many banks plan to increase their range of on-line services. Banks' plans indicate a 125 percent increase in the number of banks offering Internet banking by year-end 2000, and a 150 percent increase in the number of transactional Internet banks offering a PREMIUM set of multiple on-line services.[42] Three planned product increases in particular stand out. As illustrated in Figure 5, the number of banks offering cash management services could increase by over 500 percent, on-line insurance offerings by banks may increase 280 percent, and there may be more than a 200 percent increase in the number

[42] See Furst, Lang, and Nolle (2000) for details on planned increases in Internet banking offerings by national banks.

Table 13—Internet banking in 2001?

	Third quarter 1999	Fourth quarter 2000 [a]
Number of national banks offering Internet banking [b]	464	1046
Percent of national banking system assets	89.2	95.2
Percent of small deposit accounts in the national banking system [c]	84.1	92.8
Percent of national banks in asset size category:		
All	19.9	44.9
Less than $100 million	7.2	25.3
$100 million to less than $1 billion	27.4	61.1
$1 billion to less than $10 billion	64.1	89.9
$10 billion and over	100.0	100.0

Memorandum:
46.2 percent of national banks had no plans as of the third quarter of 1999 to offer Internet banking in 2001 or beyond.

Source: Office of the Comptroller of the Currency

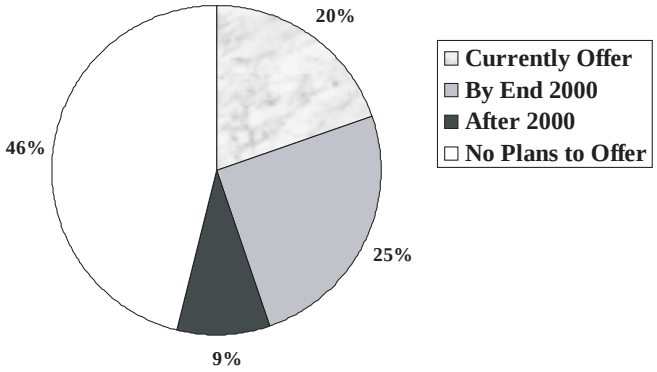
[a] Based on OCC examiners' knowledge of the Internet banking plans of national banks, as of the third quarter 1999. Percentage figures for assets, small deposit accounts, and banks per size category for fourth quarter 2000 were calculated by taking banks offering Internet banking as of the third quarter 1999, plus banks with plans to offer Internet banking by the end of 2000, relative to third quarter 1999 assets, small deposits, and numbers of national banks, respectively.

[b] FDIC-insured commercial banks excluding credit card banks.

[c] Percent of number of deposit accounts under $100,000.

Figure 4—Internet banking and national banks: potential growth

Percent of FDIC-insured national banks with transactional Internet banking

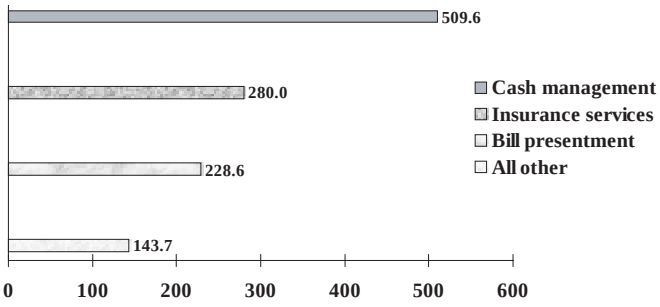


Source: Office of the Comptroller of the Currency

of banks offering electronic bill presentment. Significantly, large banks' plans to offer on-line business services (cash management) are more aggressive than those of smallest

Figure 5—Biggest percentage increase planned for on-line cash management, insurance services, and bill presentment

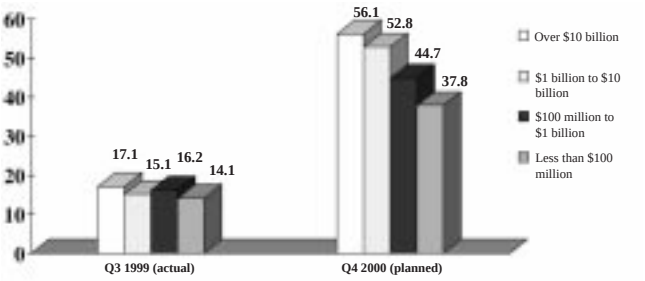
Planned percentage increases in the number of national banks offering selected on-line services by year-end 2000



Source: Office of the Comptroller of the Currency

Figure 6—Small banks may lag larger banks in offering business Internet banking

Percent of transactional Internet national banks offering on-line cash management services



Source: Office of the Comptroller of the Currency

banks.[43] Such developments might represent increased large bank competition for community banks' business customers, who some analysts believe are enthusiastic about using Internet-based banking services.[44]

[43] Indeed, several large banks have recently launched Web-based services targeting small businesses. See, for example, Hallerman (1999b), Marlin (1999), O'Brien (2000), Ptacek (2000 a and c), and Marjanovic (2000). O'Connell (2000) reports on a Meridien study which estimates costs for banks to install Internet-based cash management channels.

Some industry observers have begun to speculate that servicing the needs of business customers, rather than consumer customers, is likely to be a relatively more profitable Internet strategy for banks. See, e.g., Ptacek (2000b), O'Brien (2000), and Toonkel (2000a). For an analysis of possible roles banks could play in business-to-business commerce, see Wenninger (2000).

[44] For example, see *Bank Technology News* (1999c). See Wenninger (1999) for the growing importance of e-commerce in serving business bank customers.

Current and Future Demand for Internet Banking

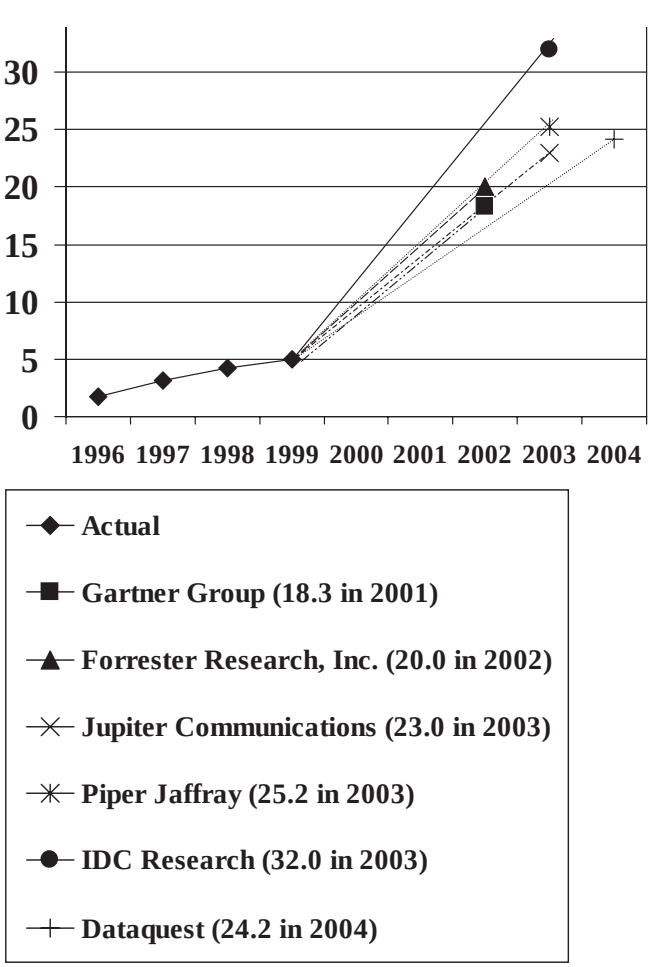
The level of "demand" for Internet banking in the future is an open question. One interesting aspect to banks' perceptions about future demand is that just under half of all national banks (46.2 percent) had no plans to offer Internet banking. Almost all of the banks without plans to offer Internet banking were in the smallest size category.[45] Clearly, some bankers have questions about how widespread and intense customer demand for Internet banking will be, and about the value of incurring the added expenses associated with offering another delivery channel.[46]

Another perspective on customer demand for Internet banking comes from considering projections about future use made by various industry analysts. Figure 7 shows that from an estimated 5.0 million U.S. households banking on-line in 1999, analysts expect growth in use of 4- to 6-fold over the next several years, i.e., perhaps to as much as 32 million households. While substantial, that level of usage would represent only about one-third of the 93 million U.S. households with a banking relationship.[47] Such growth would mean that only a minority of the household customers of banks that currently offer Internet banking, or that plan to offer it by year-end 2000, would actually choose to do their banking on-line.

Market Share of Internet Banking Customers

While opinions on the overall growth in demand for Internet banking vary widely, questions also arise about which banks will be winners and losers in the contest to secure on-line customers. The Internet is an extremely efficient device for banks of all sizes to collect and manage information in order to meet the various financial needs of individuals and businesses, in particular by integrating services or "bundling" them together.[48] On the one hand, the Internet allows financial firms of different sizes, including the smallest banks, to enter markets and

Figure 7—Industry forecasts of Internet banking



Source: Office of the Comptroller of the Currency using data from various industry sources

[45] About 9 percent of national banks planned to offer Internet banking after 2000.

[46] For summaries of a recent survey by Grant Thornton LLP on the Internet banking plans of community banks, see Winig (2000) and Agosta (2000). That survey revealed that 64 percent of the 638 community bank CEOs questioned responded that they expected to offer Internet banking by year-end 2000. The discrepancy between that result and our projections could be due to the inclusion of banks over $100 million in assets in the community banks surveyed by Grant Thornton. It is also possible that community banks are in the process of re-evaluating the relative desirability of offering Internet banking as more and more competitors go on-line. Agosta (2000) includes information from the Grant Thornton survey on small bank attitudes toward the Internet. See Carlson (2000) for a discussion of possible reasons some small banks are making the choice not to offer Internet banking.

[47] The Federal Reserve System's "1998 Survey of Consumer Finances" shows that 9.5 percent of U.S. households did not have any type of transaction account at a financial institution. See Kennickell, Starr-McClure, and Surette (2000).

[48] It should be noted, however, that data management problems are likely to continue to challenge banks of all sizes. In part this is due to the difficulties of dealing with a variety of customer databases built up over many years. See, e.g., Hallenborg (1999), and *Bank Technology News* (1999b), which summarizes a study by Innovative Systems Inc. on data management difficulties for banks. See also Horsfield (2000), who reports that an Ernst & Young survey shows that "30% of financial service companies have less than 20% of their systems integrated to show and exchange related customer information across channels and . . . 41% believe that customers will not get a consistent answer across electronic delivery channels." In addition, see the American Banker (2000b) for a discussion of Speer & Associates studies in November 1999 and March 2000 on the degree to which banks may be lagging behind nonfinancial companies in electronically collecting and using data about customers.

reach customers previously out of reach to them. On the other hand, there are substantial economies of scale and scope in data storage and data processing, and larger banks are better positioned to exploit such scale and scope economies than smaller banks. In addition, the proliferation of Internet Web sites means there may be a substantial advantage for banks able to distinguish their products from those of other banks (i.e., to engage in "branding"). Doing so will require significant resources for advertising and marketing, a fact that is likely to work to the advantage of large firms.[49]

Independent industry estimates of the current usage of Internet banking among the top five banks in terms of numbers of customers on-line are displayed in Table 14.[50] These estimates show a disproportionate concentration of Internet banking customers among a handful of large banks. In particular, as shown in the "market shares" columns, the top five Internet banks account for almost 36 percent of all U.S. customers using Internet banking; by comparison, these same five banks accounted for just over 20 percent of all small deposit accounts.[51] Indeed, the top two Internet banks together account for almost one quarter of all Internet banking customers in the United States. And, as a group, the top five Internet banks experienced more than a doubling of the number of customers using Internet banking between mid-1998 and the end of 1999. That rate was more than five times the estimated percentage increase in customer usage of Internet banking overall in the United States.[52]

Even among the top five Internet banks, however, there is evidence of differences in success at attracting custom-

[49] See Toonkel (2000c) for a report on Internet banking advertising strategies being employed by several large banks, and estimates from an Ad Relevance Inc. study of the advertising expenditures of three large banks. Some banks are choosing to focus on niche markets or "affinity groups" as an Internet banking strategy. For a report on how several banks are pursuing this strategy, see Weitzman (2000).

For a discussion of the strategic choices facing banks, and the possible consequences of Internet banking choices on banking industry structure and competition, see DeYoung (2000). See also Radecki, Wenninger, and Orlow (1997), Mishkin and Strahan (1999), and Jordan and Katz (1999) for analyses of possible effects of Internet banking and other retail payment system innovations on banking industry structure.

[50] As indicated in the source note in Table 14, the information in the table on Internet banking usage is from industry analysts, not from data supplied by OCC examiners. See especially O'Sullivan (2000b), who summarizes data from a November 1999 survey by Gomez Advisors Inc. on Internet banking usage.

[51] Recent reports and analyses suggest that some banks in other countries have been at least as successful as U.S. banks in securing on-line customers. For example, see Moody's Investors Service (2000b), Rhoads and Portanger (2000), and Power (2000a and b).

[52] See Figure 7.

Table 14—Top five Internet banks: estimated growth in number of Internet banking customers, and market shares of on-line customers

	Customers using Internet banking				Market shares	
Banking company	Second quarter 1998	Fourth quarter 1999	Growth from second quarter 1998 to fourth quarter 1999 (percent)	Bank's "active" on-line customers as a percent of bank's total number of on-line customers [a]	Bank's share of all U.S. on-line banking customers (percent) [b]	Bank's share of all small deposit accounts [c]
Wells Fargo	655,000 [d]	1,454,100	122.0	55.7	13.1	5.0
Bank of America	700,000 [e]	1,176,600	68.1	46.5	10.6	8.4
Bank One Corp.	144,200 [f]	488,400	238.7	47.3	4.4	2.6
Citibank	350,000	432,900	23.7	63.1	3.9	1.4
First Union Corp.	70,000	421,800	502.6	39.9	3.8	3.8
Top five total	1,919,200	3,973,800	107.1	51.1	35.8	21.1

Source: Office of the Comptroller of the Currency using data from Faulkner & Gray (1998); O'Sullivan (2000b); and Federal Financial Institutions Examination Council, Report of Income and Condition

[a] "Active" customers are defined as those who bank on-line at least once a month.

[b] Fourth quarter 1999.

[c] Second quarter 1999.

[d] For comparability with fourth quarter 1999 figure, includes pre-merger on-line customers at Norwest bank.

[e] For comparability with fourth quarter 1999 figure, includes pre-merger on-line customers at NationsBank.

[f] For comparability with fourth quarter 1999 figure, includes pre-merger on-line customers at First Chicago NBD.

ers to use Internet banking. For example, from the second quarter of 1998 through the fourth quarter of 1999, growth in customer usage varied widely. One bank saw its Internet banking customer base increase by less than 25 percent, while another experienced a six-fold increase in customer usage of Internet banking. In addition, there is variation among the banks in the percent of their "active" on-line customers who use Internet banking at least once a month. Only two of the five Internet banks have more than a 50 percent active customer rate.

6. Summary and Conclusions

Our analysis indicates several significant differences in the profile of banks offering Internet banking relative to non-Internet banks. Broadly speaking, Internet banks rely more heavily on noninterest income and less on core deposits for funding than do non-Internet banks. For all but the smallest size banks, Internet banks have higher returns on equity than non-Internet banks. Internet banks with assets under $100 million had significantly worse accounting efficiency and profitability ratios compared to non-Internet banks in the same size category. Those differences in performance were primarily due to the influence of *de novo* small banks offering Internet banking.

The current low level of customer usage of Internet banking, as well as the relatively modest cost of setting up an Internet banking Web site, makes it unlikely that Internet banking is having a sizeable direct impact on the bottom line of most institutions. We interpret our results as explaining the characteristics of banks that decide to become early adopters of Internet banking, rather than as an indicator of the impact of Internet banking on bank performance. One exception to this general rule might be found among the handful of large banks with a disproportionately large share of Internet banking.

It is also possible that Internet banking is having a causal impact on the bottom line of small banks, particularly *de novo* institutions. Some of these institutions are relying heavily on an Internet-based business strategy, and the full costs of offering Internet banking, while not prohibitive, may be significant for these banks. In addition, while *de novo* Internet banks had poorer performance ratios than non-Internet *de novos*, further investigation will be needed to determine whether these banks' performance improves as e-banking and e-commerce expand over time. Indeed, further research is required to give a more definitive answer to the questions of whether, and how, Internet banking affects bank performance for banks of all sizes and ages.

On the demand side, while only one out of five national banks offered Internet banking as of the third quarter of 1999, our estimates indicate that a large majority of banking customers has accounts with institutions offering Internet banking. Thus, the availability of Internet banking is currently sufficient to accommodate the kind of sudden and rapid growth that has occurred in other information-intensive industries such as securities brokerage, book selling, and travel. So far, however, bank customers have not been convinced that Internet banking products and services provide sufficient value to warrant a substantial change in their banking habits.[53]

There is no doubt that the revolutionary developments in information and communications technology is having, and will continue to have, a profound impact on the banking and financial industry. Internet banking will be an important component of these developments, and as such, analyzing developments in this market will be extremely important for understanding developments in the banking industry. This article attempts to provide a useful picture of the current market for Internet banking, as well as information on the Internet banking plans of national banks. We believe this is an important initial step in analyzing the current and likely future impact of Internet banking on the banking industry.

[53] Furst, Lang, and Nolle (1998) argue that the likely method for increasing the value added from Internet banking for banking customers is to develop improved on-line methods for bundling information into a smooth end-to-end electronic process that eliminates relatively costly paper components of transactions. They also argue that the value proposition from such improvements would likely be, at least initially, most evident for businesses rather than individual households.

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DE NOVO BANKS AND SMALL BUSINESS LENDING: WHAT DO WE KNOW? WHAT SHOULD WE KNOW?

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Presented at the
Small Business Administration
Conference on
"The Changing Banking Structure
and Its Impact on Small Business"
Washington, D.C.
June 15, 2000

Revised: June 16, 2000

SUMMARY

- Background (A): Lending (finance) is special

- Background (B): Implications of the asymmetric information paradigm

- Background (C): Bank consolidation

- Background (D): Bank size matters

- Bank age matters

- Why do de novo banks focus on small business lending?

- Where/when do de novo banks arise?

- Who starts de novo banks?

- Conclusion

BACKGROUND (A): LENDING (FINANCE) IS SPECIAL

- Lending (finance) has an inherent, unavoidable time aspect

    -- Lenders lend at an "early" point in time

    -- Borrowers repay at a "later" point in time

- Lenders want/expect their money back; they fear being stiffed

- Problems of asymmetric information:

    -- Adverse selection

    -- Moral hazard

- Selectivity in lending

    -- Gathering extensive information beforehand

    -- Saying "no" to some applicants

    -- Setting amounts/terms commensurate with risk

- Monitoring borrower during the term of the loan

    -- Developing a relationship

- Some useful diagrams; see Figures 1 and 2

BACKGROUND (B): IMPLICATIONS OF THE ASYMMETRIC INFORMATION PARADIGM

- Information matters (a lot)

    -- Potential borrowers who are more informationally transparent will fare better in the financial markets

    -- Lenders who are better at gathering information and monitoring borrowers will fare better in the financial markets

    -- Accounting matters

    -- History, laws, culture, technology matter

- Lenders and borrowers will tend to sort themselves

    -- The most transparent borrowers will be able to access the securities markets

    -- The least transparent borrowers will have to rely on self-finance, family, and friends

    -- The group in between will rely on information specialists, probably intermediaries

    -- Technology will affect the boundaries

BACKGROUND (C): BANK CONSOLIDATION

	1985	1999
Number of banks	14,416	8,580
Average size of bank (assets, $M)	$189	$668
Number of banks greater than $10B	27	76
Number of banks less than $100M	11,801	5,157

- Over 10,000 bank mergers in the 1980s and 1990s, large and small

BACKGROUND (D): BANK SIZE MATTERS

- Larger banks tend to devote a smaller percentage of their assets to small business lending than do smaller banks

- Larger banks use different criteria (by-the-numbers, "cookie-cutter") for loan approval/denial decisions than do smaller banks ("character")

- Why?

    -- Larger banks have more diverse investing/lending opportunities that are open to them

    -- Larger banks may be less efficient at the information-intensive, relationship-oriented processes of small business lending

- Has the application of credit scoring technology to small business lending changed this inverse relationship?

BANK AGE MATTERS

- De novo banks tend to devote a larger percentage of their assets to small business loans than do otherwise similar incumbents

    -- This is also true for de novo banks' lending to farmers, although the relationship is considerably weaker

- "Adolescent" banks tend to devote a smaller percentage of their assets to small business lending than do de novo banks but a larger percentage than do older banks

    -- This "youth" effect is exhausted at about 20-25 years of age for the bank; see Figure 3

- Has the application of credit scoring technology to small business lending changed this inverse relationship?

WHY DO DE NOVO BANKS (AND ADOLESCENTS) FOCUS ON SMALL BUSINESS LENDING?

- The inverse age effect persists even after bank size, urban location, market concentration, holding company membership, etc., are controlled for

- Hypothesis: Young banks may find it easier to lend to young enterprises (whose pre-existing ties with a bank are weak or non-existent) than to try to "steal" a business customer away from an incumbent bank (the importance of relationships)

  -- Consistent with the asymmetric information paradigm

  -- Young enterprises tend to be small

WHERE/WHEN DO DE NOVO BANKS ARISE?

- De novo banks have been quantitatively important: 3,875 entrants between 1980-1998

- De novo bank entry is positively related to prior mergers and acquisitions

    -- About 20% of urban entry can be explained by prior mergers and acquisitions

- De novo bank entry is also positively related to:

    -- Urban location

    -- Larger markets

    -- Market profitability

    -- Higher state growth rates

    -- State history of unit banking

WHO STARTS DE NOVO BANKS?

- Open research question

- Hypothesis: De novo banks are started by the "dispossessed" executives from earlier bank mergers

    -- Consistent with the entry evidence

CONCLUSION

- There is an important, interesting link between de novo banks and small business lending

- Open entry for banks (subject to safety-and-soundness considerations) should be encouraged for general competition reasons and because it benefits small business lending

- Further research:

  -- Has the application of credit scoring technology to small business lending significantly changed any of these empirical regularities?

  -- Why does bank age matter?

  -- Do de novo banks focus on lending to younger enterprises?

  -- Who starts de novo banks?

  -- Why are so few de novo banks focusing exclusively on the Internet as a business strategy?

- Small business lending continues to be a ripe area for interesting research and policy applications

FIGURE 1: THE SPECTRUM OF INFORMATIONAL OPAQUENESS/TRANSPARENCY

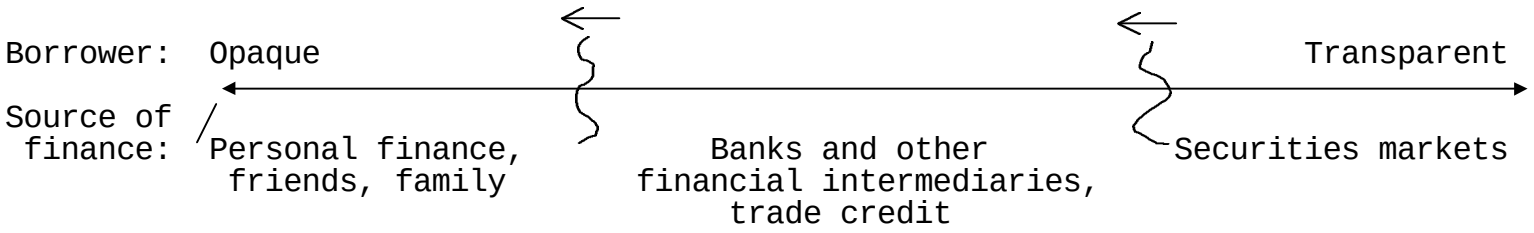
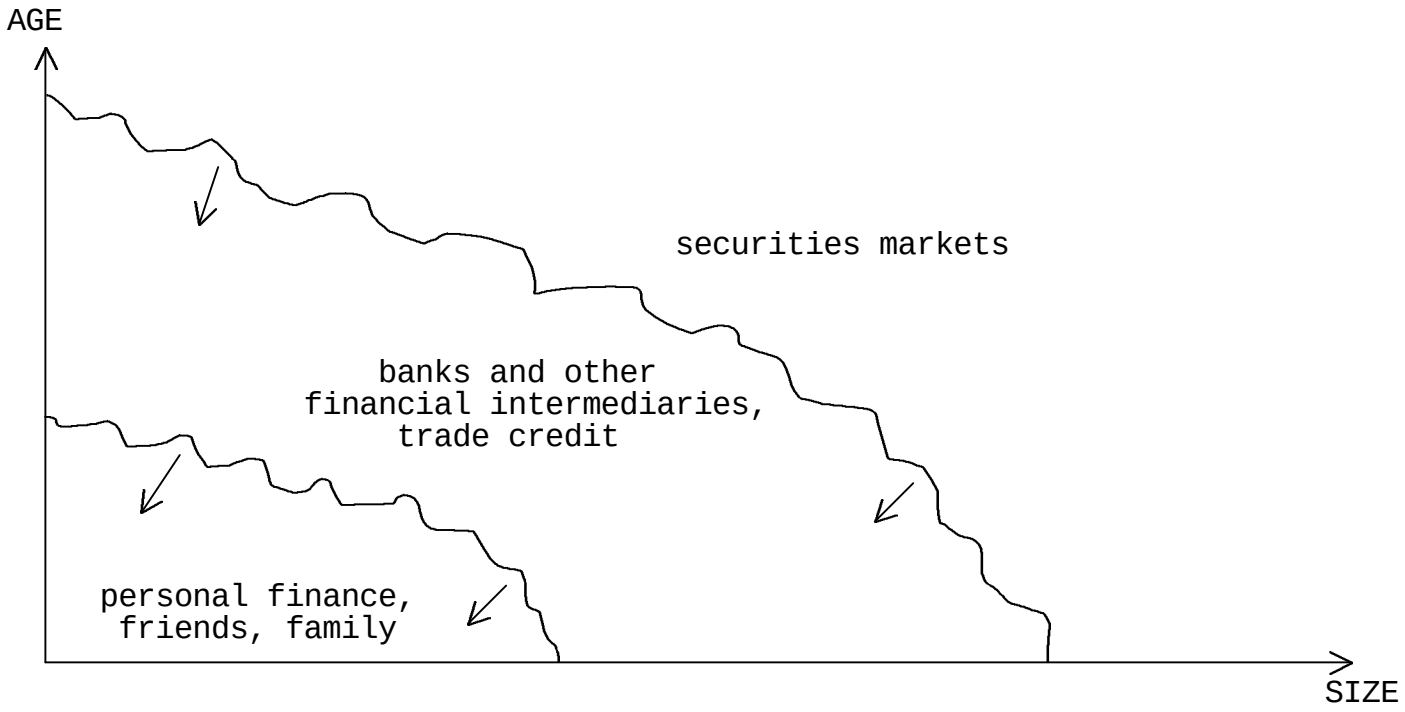


FIGURE 2: TWO DETERMINANTS OF OPAQUENESS/TRANSPARENCY



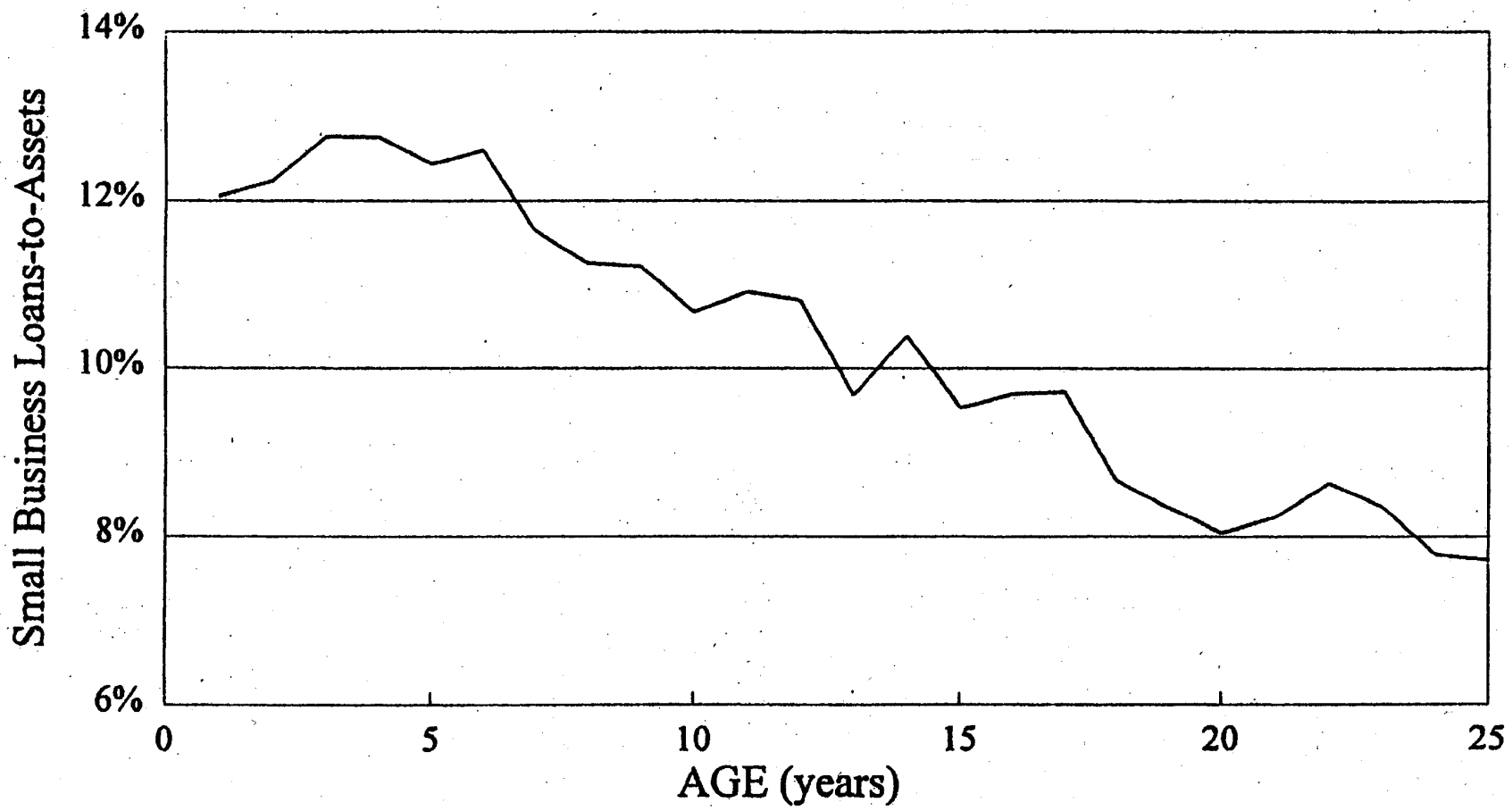


Fig. 3: Small business loans/assets.